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RESEARCHES

ON THE

PATHOLOGY OF THE INTESTINAL CANAL.

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PART I.

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PART I.

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By JOHN ABERCROMBIE, M. D. Fellow of the Royal College of Surgeons of Edinburgh.

AFTER all that has been written on this subject, the pathology of the intestinal canal still presents an interesting field of investigation. When we consider the delicacy of its structure, its great extent, and the important functions which it has to perform, we expect to find its diseases numerous and dangerous, and in their nature often obscure and intricate. Externally it is a serous membrane, and liable to the diseases incident to that particular structure; internally it is a mucous membrane, and liable to the diseases of mucous membranes; and it is, besides, through its whole extent, a muscular organ, upon the healthy action of every part of which it constantly depends for the proper discharge of its functions. It is six times the length of the body to which it belongs, and connected with it there are the delicate organs concerned in digestion and absorption, which have diseases peculiar to themselves.

The acute diseases of the intestinal canal seem to arrange themselves under two heads. (1.) Diseases affecting it as a



muscular organ, or derangements of its peristaltic motion. (2.) Inflammatory diseases. Under the former division, we are led chiefly to the important subject of Ileus ; under the latter, to a class of diseases, which, though they agree in the general characters of inflammation, vary remarkably according to the particular structure in which they are seated, the serous, the mucous, or the muscular coats. The organic diseases, and several chronic affections of the intestines, are so connected with one or other of these leading classes, that the consideration of them must be very much combined.

## PART I.

### *Of Derangement of the Peristaltic Motion of the Intestinal Canal.*

THE peristaltic motion of the intestinal canal consists of a series of alternate contractions and dilatations, to which nothing analogous exists in any other part of the body. In regard to the various conditions of the muscles concerned in it, there are several circumstances that deserve particular attention.

When healthy intestine is empty, it seems to contract entirely, so as to assume the appearance of a solid cord, white and corrugated. Nearly the whole tract of intestine may occasionally be seen in this state in the bodies of infants, who before death had been much purged, or had been affected with diarrhoea without disease of the coats of the intestine. A portion of intestine, again, that has been the seat of inflammation and gangrene, though it may be empty, does not contract in this manner, but falls flat, presenting a broad surface like an empty bag. (See Case 4th.) The contraction, therefore, in the former case, is a muscular action which is lost in the latter ; it is that property of muscles, by which they contract when nothing opposes their contraction. It has been called by physiologists the tonic power of muscles : it is not a mere shrinking by elasticity, but a muscular action of great power, as may be seen on the surface of the body, in the force with which muscles contract when their antagonists are paralysed.

When intestine is thus empty and contracted, it is probable that the muscular fibres are at rest ; and the presence of some contents is probably required to bring into action the peristaltic motion. One portion of the canal then contracts upon the matter contained in it, propelling it forward into another which is thus distended, and then contracts in its turn, propelling the contents forward into a third portion, and so on. Now various actions take place in this process. When a portion of



intestine, which I shall call No. 1., propels its contents forward into a portion, No. 2., which is supposed to be empty, it must contract with such force as not only to propel the contents, but also to overcome the tonic contraction of No. 2. Again, when No. 2. contracts and propels the contents into another portion, No. 3., by what power are they prevented from returning backwards into No. 1.? It is probable, that though No. 1. and No. 3. are both in a state of contraction, they are nevertheless in a different condition, No. 3. being contracted merely by its tonic power, and No. 1. retaining, besides this, a degree of the actual force with which it had lately contracted in propelling the contents into No. 2., and being thus in a state less liable to be distended than No. 3. There are also circumstances which render it probable that relaxation to a certain extent takes place in the fibres of the lower part, while the peristaltic motion is going on in the healthy manner.\* Thus in the healthy condition of the parts, the motion is propagated downwards, not perhaps in the simple manner which I here suppose, but in a manner sufficiently analogous to it, to answer the purpose of this illustration. In the actual condition of the function in a healthy body, a part does not probably empty itself at once, but by a succession of contractions, propelling forward its contents in small portions. There are other circumstances also by which the action is complicated, but they do not affect the case which I have given as an illustration, and which is perhaps precisely, or nearly that which occurs under the action of a purgative, and in certain diseases of the canal in which its action is morbidly increased.

Now this process is entirely a muscular action, and there are various circumstances by which it may be deranged. When the portion No. 1., for example, has contracted and propelled its contents into No. 2., if this does not contract in its turn, the matters will lodge in it as in an inanimate sac, and the process will be interrupted: the same will take place, if No. 2. does not contract with such power as to overcome the tonic contraction of No. 3. If No. 2., again, contracts with its regular power, while there exists some obstacle to the dilatation of No. 3., the contraction will dilate No. 1. instead of No. 3., and the action will be inverted. A remarkable example of this will be found in Case 19th, in which the action was propagated downwards, till it reached the extremity of the colon, where it was inverted by an organic cause impeding the dilatation, and thence regu-

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\* See Mr A. Cooper's account of the phenomena observed in a case of artificial anus. *Treatise on Hernia*, page 38.



larly propagated upwards till it terminated in a fit of vomiting, a certain proportion of the contents, however, being continued downwards, and discharged by the rectum in the natural way.

The causes, therefore, which may interrupt the peristaltic action, are principally referable to two heads. (1.) A part having its muscular power destroyed or weakened, so as to render it incapable of acting in unison with the other parts. (2.) A part being, from some cause, incapable of that degree of dilatation which is necessary for enabling it to propagate the action. Let us consider briefly each of these cases.

I. Suppose that the series of contractions and dilatations have gone on through successive portions of intestine, which I shall call Nos. 1, 2, 3, 4, and 5, and that No. 5. has its muscular power so diminished, as to be incapable of dilating No. 6.; an interruption will take place, and an accumulation of matter in No. 5. The healthy parts above are still acting, and propelling additional matter into No. 5., and if by this additional stimulus it shall be excited to contract with additional force, the interruption will be removed. If not, the healthy parts above will be excited by the interruption to increased contraction, and one of two consequences will probably follow. No. 5. being considered as an inanimate sac, by the increased impulse from above, the matters may be forcibly driven through it, so as to distend No. 6., and so continue the action, allowing No. 5. to contract and recover itself; or, if it fail in this, the increased impulse will only tend to increase the distention of No. 5. until it is distended beyond its power of contraction, or paralysed from over distention. Thus, I conceive, is formed a paroxysm of simple ileus, and the effects vary according to particular circumstances. From the part thus diseased, the action may be inverted and communicated upwards, or if the healthy parts above are loaded with contents, they may be thrown into still more violent action downwards. If this action should still fail in restoring the natural course of the function, the parts will be exhausted in their turn. The dilatation will extend to No. 4., and the parts above continuing to act, this also will be distended beyond its power of contraction, and so on. The appearances on dissection in fatal ileus correspond with these conjectures. The lower part of the canal is found empty, contracted, and healthy. This terminates abruptly at a certain point, and is succeeded by a portion distended to the greatest degree, loaded with feculent matter and flatus, in some cases quite thin and transparent, in others inflamed and gangrenous. From this portion, the distention is traced upwards, sometimes to the very commencement of the canal. The immense quantities of gas



which are found in the distended intestine in these cases, are probably separated from the stagnant matters contained in it, and, not being thrown off, must prove a powerful cause of distention.

II. Suppose the series of contractions and dilatations to be propagated downwards as before, and that, from some cause, No. 6 is rendered incapable of the same degree of dilatation as the other parts, though without being by any means actually obstructed.—The effect here will vary according to circumstances. From the state of the action in general, and the usual quantity of contents, it may happen that, in ordinary cases, no greater degree of dilatation is required than No. 6 is capable of transmitting, and the process will go on without interruption. But if, from an increased quantity of contents at a particular time, or an accidental accumulation of flatus, a greater degree of distention shall be communicated to No. 5 than No. 6 is capable of, then an interruption will take place in No. 5 in the same manner as in the former case,—and the parts above continuing to act, it will be in danger of being over distended. The interruption may be temporary,—may frequently take place, and be soon removed, until at length, from some cause which eludes our observation, it terminates in perfect ileus. This form of the disease is strikingly illustrated in Cases 9 and 10, in which it is to be particularly observed, that there was no mechanical obstruction. In such cases also, it is to be remarked, that a certain quantity of the contents may pass through, as occurred in Case 19, and probably in Case 9. In Cases 9 and 10, the cause was evidently of long standing. Cases 11 and 12 exhibit remarkable examples of the affection from causes of a more recent kind. This form of the disease may also arise from organic contractions of a mechanical nature, as in Cases 13 and 14, in which the contraction had gone on, producing little inconvenience, until it terminated at length in fatal ileus. This modification of the disease may also be fatal by gradual exhaustion, without perfect ileus, as in Cases 19 and 20.

In this manner, I conceive, is formed the paroxysm of ileus. The farther progress of the affection varies in different cases. After a certain period, the parts may recover their healthy relations, and the disease be removed,—or it may continue till an extensive portion has been paralysed by over distention, and the case probably becomes irremediable. There is reason to believe, that it may in this state be fatal, without farther disease; but the common progress of it is to inflammation and its consequences. We cannot explain this phenomenon; but we know, that all parts that are rapidly distended are liable to in-



flammation. We see it in the inflammation which attacks the distended urinary bladder, and the integuments covering certain tumours which have increased rapidly. We see the converse in the remarkable effect of collapse of the cornea in relieving inflammation of that organ.

The opinion which I have proposed in regard to the pathology of ileus, differs considerably from a doctrine which considers this disease as originating in spasm. According to this system, the parts which on dissection are found contracted, are supposed to be contracted by spasm, and, consequently, to be the primary seat of the disease. Many considerations induce me to doubt this hypothesis.

1. Though all muscular organs may be considered as liable to spasm, I think it very doubtful whether such fibres as those of the bowels are really affected by it in such a degree as to prove a cause of disease. Our knowledge of the pathology of such muscles must be derived chiefly from the urinary bladder, as this organ admits of a more correct knowledge of its condition under disease than any other internal muscular organ. Now, we are familiar with a state of the bladder in which it is distended beyond its power of contraction; but we have no reason to believe, that it is ever spasmodically contracted so as to resist distention. We talk of spasm of the stomach; but if the stomach were contracted by spasm, in the manner which this hypothesis supposes in regard to the intestines, its cavity would be so much diminished that very little could be received into it. But, instead of this, we find persons labouring under the affection which has received this name, swallowing hot water and other liquids in large quantities.

2. Spasm, even in powerful muscles, is generally of short continuance, and it is very uncommon to find it continuing for such a length of time as this hypothesis supposes. The only example, perhaps, is in trismus, in which very powerful muscles are concerned. It is certainly very doubtful whether such fibres as exist in the intestinal canal could contract with such force, and continue in powerful contraction for so long a time as would be required to constitute an attack of ileus.

3. A great extent of intestine, perhaps the lower half, may occasionally be found in this contracted state. It is not probable that such an extent should be at once contracted by this powerful spasm; and that the whole of this portion is not contracted by spasm, appears from the facility with which, in many cases, it admits of large quantities of fluid being thrown in by injection.

4. In fatal ileus, which has been going on for many days,

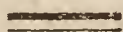


the contracted portion may be still found perfectly healthy, the morbid appearances, inflammation, adhesion, ulceration, and gangrene, being entirely confined to the distended portion.

5. That the distended part is really in a state of paralytic inaction, is probable, from the remarkable case (Case 12) in which the disease was seated so low, that the contracted part could be fully dilated by mechanical means, but without relieving the disease.

6. That spasmodic contraction is not the primary disease, is probable from many cases in which there is really no obstruction, but the bowels are freely moved at various periods of the complaint. (See Cases 1, 3, 8, and 9.)

From these considerations I am induced to believe that, in simple ileus, the proper seat of the disease is the distended portion,—that this portion has lost its power as a muscular organ, being distended beyond its power of contraction, and that the contracted part (which has probably been emptied by injections) is kept in that contracted and quiescent state by its tonic power, and the suspension of the action from above, by which, in the healthy condition of the parts, it would have been distended.



#### VARIETIES OF ILEUS.

It is probable that the morbid action at the commencement of an attack of ileus, is a derangement of the relation in muscular action, betwixt one part of the intestinal canal and another immediately adjoining, with which it ought to have acted in concert. When we endeavour to investigate the manner in which this derangement may take place, we find the disease appearing under three modifications.

1. Simple Ileus, without any organic affection.
2. Ileus, proceeding from an organic affection, but of such a nature that it acts by deranging the muscular action, without mechanical obstruction.
3. Ileus with mechanical obstruction.

#### SECT. I.—*Simple Ileus.*

Simple Ileus is to be viewed as the disease of a muscular organ, and originating in derangement of muscular action. The leading appearances which the fatal cases present to us are, one part of the intestinal canal empty and contracted, and another part highly distended. In attending farther to the phenomena of the disease, the following varieties deserve our attention.

I. The disease may be fatal in this state of over distention, without inflammation.

CASE 1.—A man, aged 40, (a shoemaker,) had been for some time affected with slight symptoms which were referred to the liver. On the 25th of August 1814, he was seized with an attack resembling cholera, which, after some medicine that was given him, was speedily succeeded by the usual symptoms of Ileus. He had severe pain of the abdomen; urgent vomiting; and costiveness; his pulse was generally about 96, and at last rose to 120. The pain was at times increased by pressure, but not uniformly so. He was twice bled, and the other usual remedies were employed without avail. He died on the 30th. I saw him for the first time on the 30th, when he was moribund. His bowels had been freely moved by medicine on the 29th.

*Dissection.*—The lower part of the right lobe of the liver was unusually soft. The only other morbid appearance was a considerable part of the intestinal canal in a state of great distention, without inflammation.

This is perhaps an unusual termination of the disease in adults, but I believe infants are frequently cut off in this manner, by the mere interruption of the healthy action of the intestinal canal.

II. The disease may be fatal with recent inflammation, without gangrene, or any of its other consequences.

CASE 2.—A woman, aged 20, (23d June 1813,) was affected with violent pain of the upper part of the abdomen and towards the left side, at times increased by pressure, and varying considerably in its degree of severity; frequent and violent vomiting; obstinate costiveness; belly tumid and tense; tongue white; pulse 76, and rather small. On the 16th she got wet during the flow of the catamenia, which ceased, but returned at night; pain about the umbilicus began on the 17th, and increased gradually; vomiting began on the 21st, with hiccup.

Blood-letting; blistering; various purgatives; injections; warm baths, &c. were employed by a physician of eminence.

24th. Incessant screaming from the violence of pain; every medicine vomited instantly; pulse 88, and rather small; frequent hiccup; pain increased on pressure; no stool.

25th. No stool; pain almost gone; every thing vomited; pulse very feeble.

26th. No stool; free from pain; vomiting continued, with hiccup. Died in the night.

*Dissection.*—The whole of the colon, and about 12 inches of the lower extremity of the ileum, were empty, contracted, of a white colour, and seemed perfectly healthy. The remainder of the small intestine was distended to the greatest degree, and appeared thin and transparent. It contained chiefly watery matter and air. On the surface of the distended part there was in several places considerable inflammation, especially at the lower part, near the contracted portion. These parts were of a vivid red colour, without any tendency to gangrene,



and without exudation. There was a small abscess in the left ovary; the stomach, liver, &c. were healthy.

III. The disease may be fatal with extensive inflammation and gangrene.

CASE 3.—A young man, aged 19, (17th October 1813,) was affected with violent pain round the umbilicus; incessant vomiting; abdomen hard, tense, and a little tumid; bowels obstinately costive; pulse 84; countenance depressed and anxious; had been ill six days, during which a variety of remedies had been employed without relief.

In this severe case, every variety of practice was employed in the most active manner; repeated general and topical bleeding; blistering; various purgatives and injections; tobacco injections; cold applications; cold injections; crude mercury, &c. &c.

18th. Pulse 120; no relief; belly tympanitic; some feculent discharge by injections; urgent vomiting, but not feculent.

19th. Pulse 112; symptoms rather abated; some feculent evacuations.

20th. Pulse 92 to 96; symptoms aggravated; belly much swelled; every thing vomited almost instantly; pain continued violent; some evacuation of watery matter.

21st. Pulse not to be felt at the wrist; in the humeral artery it was 80 and regular; violent pain; no stool; great depression. Died an hour after the visit.

*Dissection.*—The stomach was healthy. Almost immediately below it, the intestine was distended to the greatest degree, in some places quite thin and transparent; in others highly inflamed and gangrenous, bursting when handled; in other places firm, though perfectly black. This state of disease continued to the middle of the small intestine, where a portion 12 inches in length was empty, contracted, and in its appearance quite healthy. Below this the canal was again diseased as above, distended, inflamed, adhering, and gangrenous, until three inches from the termination of the ileum, when it became suddenly contracted, empty, and white; but this and the other contracted portion were perfectly pervious, easily dilated, and in their coats quite healthy. The colon was healthy and collapsed, except at the lower part, where it contained some consistent feces; the other viscera were sound. The diseased portion of intestine was chiefly distended by air. It contained in some places thin feculent matter, but in no great quantity, and no consistent feces could be found in any part of it.

CASE 4.—A boy, aged 12, (26th October 1813,) was affected with violent pain of the belly, chiefly around the umbilicus, vomiting, and some degree of swelling of the belly; pulse 50, soft and regular. Had been ill two days, during which he had had no stool. Various remedies were employed without benefit. 27th. Pulse 120, pain increased, with tension of the belly and tenderness on pressure, had only vomited once. Blood-letting was used in the morning, and again at 3 P. M. after which the pulse fell to 112. The other usual means were em-

ployed without procuring any stool; the pain continued unabated; the pulse rose again to 120, and became extremely weak, with coldness of the body; and he died between seven and eight o'clock in the evening, having continued in violent pain until immediately before death. I did not see this case during the life of the patient. I was present at the examination of the body. *Dissection.*—The stomach was sound, the small intestine was a little distended and slightly inflamed, especially at the lower part, where it had contracted some adhesions. The whole right side of the colon was in a state of gangrene, especially the caput cæcum, which had burst and discharged into the cavity of the peritonæum a large quantity of fluid feces. The diseased parts appeared to have been much distended, and, after being emptied by the rupture, had not contracted, but had fallen flat, presenting a very broad surface like an empty bag. At the upper part of the ascending colon, this diseased part terminated at once in healthy intestine, white, collapsed and empty. This was the state of the remainder of the colon, except the sigmoid flexure, which, with the rectum, contained much consistent feces.

The causes of simple ileus are not well ascertained, and the operation of them is involved in considerable obscurity. It is probable, that they may be referred to two heads: 1. The presence of substances which oppose some resistance to the propelling power of the canal. 2. Causes which diminish the muscular power of a part of the canal itself. 1. The action of the former is illustrated by those cases in which ileus has been distinctly traced to the presence of a large biliary calculus, or other concretion in the intestine. Some of these cases have been fatal, and, on dissection, the usual appearances of ileus have been found above the seat of the concretion. In others, after violent symptoms of several days continuance, the extraneous body has been expelled with immediate and complete relief.\* It is probable that masses of indurated feces, and indigested articles of food, may act in this way as a cause of the disease. One severe case which I am acquainted with, seemed to have been induced by a large quantity of nuts, which had collected into a mass in the bowels, and were at length discharged, with relief of all the symptoms. If one portion of the canal were in that state of dilatation which precedes its contraction, and this contraction were impeded by a cause of this kind lodging in the portion immediately below, while the healthy parts above were forcibly propelling new matters downwards, it is, I think, easy to conceive how the former part might be-

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\* See a Case by Mr Thomas, Med. Chir. Trans. Vol. VI. p. 98.



come over-distended, in the manner which I have conjectured to constitute ileus. 2. The causes of the second class are more obscure, and perhaps still more founded in conjecture. We know the uneasy feelings that are produced by an accumulation of gas moving slowly through the bowels, distending one part after another, in the affection which is called flatulent colic. The distended part in this case can often be felt externally, so as to be ascertained to be the seat of the pain; and it is sometimes so firm and tense, that I have more than once seen it mistaken for a mass of organic disease. In a short time, perhaps in a few hours, it is gone. Now, were a distending cause of this kind, in its progress through the canal, to arrive at a part, the muscular power of which had been impaired, it is, I think, easy to conceive how this part might be distended to a degree from which it could not contract,—the consequence, I imagine, would be an attack of ileus. That this is a real disease of muscular fibres of this kind, we know from the effect of distention of the bladder, and we know also, that when the fibres have been once weakened by such an attack, it is liable to occur again from a smaller degree of distention than that which originally induced it. On the same principle, a person who has suffered an attack of ileus is often for a considerable time liable to violent attacks of pain in the abdomen, upon any irregularity in his diet, or want of attention to his bowels. What are the causes that may weaken the muscular power of a part of the intestine in the manner which I here suppose, we know not with certainty; perhaps cold is one of them. All muscles are liable to the rheumatic inflammation, and we see that it not only diminishes their power, but, in many cases, produces perfect paralysis; and even without the rheumatic state, cold is capable of directly paralysing muscular fibre. Perhaps another of these causes is over-excitement. We see ileus supervene upon cholera, and upon diarrhœa which has been attended with much irritation, especially in old people. But, without speculating farther on this point, I think we have much reason to suppose, that many cases of ileus are connected with a certain predisposition in the state of the parts. In what a different manner these may be affected by the same cause, is strikingly illustrated by the two following cases. In the one, a mechanical cause of some continuance produced violent symptoms, which ceased whenever the cause was removed. In the other, a similar cause of short continuance was followed by ileus in its most violent form.

CASE 5.—A gentleman, aged about fifty, was affected with pain of the abdomen, urgent vomiting, and obstinate costiveness; the ab-



domen was tumid and tense; the pulse natural. He had been in this state for three days, during which a variety of remedies had been employed without benefit. On examining the groin, I discovered a hernia the size of a pigeon's egg, which was soft, and not painful, and was reduced at the first touch. A laxative injection being then given, operated freely, and all his symptoms were relieved immediately.

CASE 6.—A woman, aged about thirty, on 10th October 1814, was suddenly seized with umbilical hernia, which protruded to the size of an egg, and was accompanied by severe pain across the upper part of the abdomen. I saw her about two hours after the appearance of the hernia, and it was very easily reduced, but the pain of the abdomen continued, and various purgatives and purgative injections were given without benefit. Without detailing the particulars of the case, it is sufficient for my present purpose to state, that it turned out to be ileus in its most violent form, which resisted the most active treatment for six days, and then terminated favourably, by perseverance in the usual remedies.

In these two cases, the cause was the same, and a corresponding interruption took place in the muscular action of the intestine; but in the one, this was recovered from as soon as the cause was removed; while in the other, it is probable, that a part of the canal had been injured in its muscular action in the manner which I have already alluded to, as calculated to give rise to an attack of ileus.

There are various circumstances in the history of ileus which favour the opinion, that a portion of the intestine is for a time deprived of its muscular action, and reduced to the state of an inanimate canal. When the disease is beginning to give way, the first discharges are generally watery; and we frequently see fluid matter discharged of such an appearance as gives every reason to believe that it had come from the higher parts of the canal, and in such quantity as leads us to suppose that the bowels must be emptied. Yet after this, the patient who has been taking very little nourishment, and chiefly liquid, begins to discharge, and often continues for days to discharge, quantities of indurated feces that are almost incredible, and which must have been lodging from the commencement of the disease. This can only be accounted for by supposing, that a portion of the canal had been distended, and incapable of action; that there the hardened feces had lodged, while fluid matters were driven through by the action of the healthy parts above, but that the hardened matter was not discharged till this part itself had recovered its muscular power.

Another circumstance, which I think can only be explained on

the same principle, is, that there is a modification of the disease, in which there is no obstruction, but, by the usual purgatives, liquid stools can be procured through nearly the whole course of the disease. Recovery in these cases is sometimes accompanied by immense discharges of hardened feces, which must have been lodging from the commencement of the attack.

CASE 7.—A lady, aged 35, (3d December 1813,) was affected with vomiting, and pain over the whole abdomen, which was rather tense and painful upon pressure. Pulse rather frequent. She was bled and blistered, and took laxative medicine, which operated freely, bringing off thin feces of a natural appearance. After another bleeding, on the following day, she became much exhausted, her features shrunk, her pulse feeble, and of extreme frequency; laxative medicine, which had been given again, brought off fluid feces. She now took wine in large quantities for three days, and, under this treatment, she gradually recovered from the state of exhaustion, and the pulse came down in frequency. An injection given on the 7th operated freely; and, on the 9th, she took castor oil, with which she began to discharge hardened feces in the most extraordinary masses, and in immense quantity. This discharge continued spontaneously for four or five days, and the whole quantity discharged was almost incredible. On the 15th she was well.

This modification of the disease may be fatal without obstruction.

CASE 8.—A gentleman, aged about 40, (10th November 1812,) was seized with vomiting and pain of the left side of the abdomen, his pulse varying from 40 to 60; took purgative medicine, which operated fully; and on the 11th, the vomiting had subsided, but the pain continued severe, and was more general over the abdomen; pulse 70.—12th. A tympanitic swelling appeared on the left side of the abdomen, which, on the 13th, had extended also to the right side; violent pain continued; pulse natural. On the 13th, he took purgative medicine, which operated fully four or five times. On the 14th, he was free from pain, but the swelling had extended over the whole abdomen; pulse still natural. On the 15th, the pain returned with great violence, with vomiting, and frequent pulse. It continued violent through the day and night, and he died early on the morning of the 16th. The body was not examined; but, from a case considerably similar, which is related by Morgagni, I think it probable that the distended parts had run rapidly to gangrene.

SECT. II.—*Ileus, with Organic Disease of such a Nature that it acts by interrupting the Muscular Action of the Intestine, without Mechanical Obstruction.*

CASE 9.—A gentleman, aged 24, had been, for several years, liable to violent attacks of pain in the abdomen, chiefly affecting the right side. The attacks usually continued a few hours, and were very un-



certain in their recurrence ; sometimes they returned every evening for weeks together, and sometimes he was, for weeks or months, perfectly free from them. One of his longest intervals was ascribed to taking daily a small dose of Epsom salt. On the 11th of June 1818, he suffered one of these attacks, which came on in its usual manner, and affected him with violent pain across the lower part of the abdomen, which was drawn into balls ; no vomiting ; pulse 60 ; pain alleviated by lying on his belly across the edge of his bed. Was seen by an eminent practitioner, who gave him an opiate and a purgative with relief ; bowels freely moved ; 12th, was better, but felt weak ; 13th, walked out, but at night the pain returned with violence ; pulse 60 ; an opiate was given without relief. At four o'clock in the morning of 14th, pain continued unabated ; pulse 108 ; was bled to  $\frac{3}{4}$  xii. and injections given, by which his bowels were moved freely, four times ; at 9 was found pale, cold, and exhausted, and pulse scarcely to be felt ; but there was still severe pain in the abdomen, which was a little tympanitic, but not tender to the touch. He died at two P.M. I saw him two hours before death.—*Dissection.*—The small intestine was greatly distended, and, on many places, especially on the ileum, there were inflamed portions, with effusion of coagulable lymph, and others of a dark colour, approaching to gangrene. The greatest inflammation was at the very extremity of the ileum. The right extremity of the colon was singularly turned upwards upon itself, towards the outside, so that the surface of the caput cæcum was in contact with the surface of the ascending colon, and a firm adhesion had taken place between them, about two inches in extent. The adhesion was very firm, and was evidently of long standing ; the parts immediately concerned in it appeared to be a very little thickened ; the colon and the caput cæcum were in other respects quite healthy, and without any vestige of inflammation ; other viscera healthy.

CASE 10.—A man, aged 63, had been affected with double inguinal hernia for 40 years, both of which were easily reducible, and he had been for many years liable to violent paroxysms of pain in the abdomen, during which the herniæ were generally “forced out.” He suffered one of these attacks more severe, and longer continued than usual, in November 1812. It began with shivering and nausea, with pain in the abdomen, and continued with various remissions and aggravations. He had been able to walk out about a week before his death, but was never free from pain in his bowels. During this attack, the ruptures had protruded frequently, but he always reduced them with ease till the morning of the 29th, when he failed. They were, however, readily reduced by a gentleman who then saw him, but at night, when I saw him, they had again protruded. They were easily reduced, but protruded again almost immediately, though he was lying on his back. He had some vomiting, but not urgent ; violent pain over the abdomen, which was tender and extremely hard ; pulse 120, and irregular ; features collapsed ; bowels had been freely moved by injections. Died in three hours after the visit.



*Dissection.*—Both ruptures were completely reduced, and without any adhesion to the sacs. The sacs were considerably thickened; the mouths of them were large and free; the inner surface of the sac of the left side was inflamed and sloughy. The small intestine was, down to the middle of the ileum, greatly distended, and, in many places, inflamed and gangrenous. The disease stopped at the part of the ileum which had formed the hernia of the right side; the surfaces of this portion, which had been in contact in the hernia, had formed a firm adhesion to each other, about three inches in extent. At this place, the coats of the intestine were somewhat thickened, but so as to produce very little diminution of its area, and it was otherwise quite healthy.

CASE 11.—A boy, aged eight, was affected with frequent vomiting and obstinate costiveness; his belly was swelled and tympanitic, but without much pain or tenderness; he was pale and emaciated; his pulse frequent and feeble; he had been ill for ten or twelve days. The complaint had begun with severe pain and diarrhœa; this was succeeded by costiveness, which, for seven or eight days, had resisted every remedy; for the last two days every medicine had been vomited; his exhausted state left little room for active practice, which indeed had been fully tried before; in two days more he died. *Dissection.*—The small intestine was distended to the greatest degree, down to a point in the ileum, where the following cause of the disease was discovered. Between two turns of intestine, there was a narrow band of adhesion, rather more than an inch in length. It was evidently of long standing, and, while the parts had remained contiguous, had produced no bad effect, but by some relative change of situation of the parts, another turn of intestine had insinuated itself between the two adhering portions. This portion, however, was healthy. The effect appeared to be, that the band of adhesion being thus put upon the stretch, the peristaltic motion had been interrupted. At the lower attachment of the adhesion, the intestine was drawn aside into “puckers,” and precisely at this point the distention ceased, and the canal became white, empty, and collapsed. At this point, however, there was no obstruction, and the coats of the intestine were perfectly healthy, except a circumscribed redness on the inner surface, at the point corresponding with the attachment of the band of adhesion. On the distended intestine there was slight appearance of superficial inflammation, but it was of small extent, and appeared to be quite recent.

CASE 12.—A man, aged 60, (23d April 1815,) was affected with vomiting; pain of the abdomen, which was swelled and tympanitic; obstinate costiveness; pulse 108, and soft; countenance pale and exhausted; pain not increased by pressure; had been ill a week, during which powerful remedies had been employed without benefit; had formerly had two attacks of the same kind, one of which continued a week. This man lived in great distress till the 28th, without any remarkable change in his symptoms. The swelling of the



abdomen increased gradually, until it resembled that of a woman at the most advanced period of pregnancy, yet to the last he could bear pressure upon every part of it. His pulse varied from 108 to 116 : his death was sudden ; he had been out of bed, and dressed the day before, and in the morning of the day on which he died he did not appear worse than usual. Every powerful remedy was employed, without the slightest benefit. *Dissection.*—On opening the abdomen, a viscus came into view, which appeared to be the stomach enlarged to three or four times its natural size. On a more accurate examination, this turned out to be the sigmoid flexure of the colon, in such a state of distention, that it rose up into the region of the stomach, and filled half the abdomen. The stomach was contracted and healthy. The small intestine was healthy at the upper part, lower down it became distended, and of a dark colour ; at the lower part it was very much distended, with some spots of gangrene. The colon was greatly distended ; in some places it was not less than five or six inches in diameter, and terminated in the distended sigmoid flexure already mentioned ; the rectum was healthy and collapsed ; the sigmoid flexure was of a dark livid colour, and contained air and thin feces. What appeared to be the cause of this affection remains to be mentioned. The enlarged sigmoid flexure was found to have taken a remarkable turn upon itself, so that what was naturally the right side of it lay to the left, in contact with the descending colon, and the left, or ascending part of it, lay on the right. The consequence of this was, that the rectum, as it descended from the former, passed down behind the lower, or first turn of the sigmoid flexure, where it first takes the turn from the descending colon ; also the rectum itself, at this part, received a twist as if half round. Exactly at the point where this twist was, the distention and dark colour of the intestine terminated abruptly, and it became white and collapsed. At this part, however, there was no mechanical obstruction, for the parts were pervious, and, except the twist, perfectly healthy ; and farther, it happened in this singular case, that I had an opportunity of ascertaining the state of them during life. On the 25th, three days before his death, having exhausted all the ordinary means, I was induced to examine the rectum with a large ivory-headed probang, and I found at a certain depth, (which was afterwards found to correspond with the point where the rectum was twisted,) a slight obstruction to the passage of the probang ; however, it passed up with little difficulty, and was withdrawn without any. A piece of the intestine of an animal tied at the end was carried up beyond this point, and then strongly distended by injecting water into it. In this distended state it was retained for some time, and then slowly withdrawn ; but no discharge followed it, though, as I have already mentioned, the distended part contained only air and fluid feces.

To this part of the subject are to be referred the well known cases of very small herniæ, which include only a small portion of one side of the intestine. I have seen several of these, and I



have a preparation from a fatal case, in which the strangulated portion is not above one-third of an inch in depth, and in diameter like the point of the little finger, the area of the intestine, except this little portion, being quite free. The symptoms and the morbid appearances were precisely similar to those in the cases already mentioned; the intestine above the hernia being greatly dilated and highly inflamed, with some portions gangrenous, and, below the hernia, empty, collapsed, and healthy.

The cases which I have described under this article appear to me to be of considerable importance, and to throw some light upon the pathology of ileus. The disease in all of them was distinctly referable to a cause which was obvious on dissection, and yet the cause was such as produced no mechanical obstruction. This was most remarkable in Cases 9 and 10, in which the cause was evidently of long standing, and in Case 12, in which there was an opportunity of fully dilating the contracted portion, three days before the death of the patient. In these cases, then, the seat of the disease must have been the distended portion. We have seen it existing without inflammation, and the only idea we can form in regard to the nature of the primary disease, I think, is a muscular organ distended beyond its power of contraction. The paroxysms which had often occurred in Cases 9 and 10 were also remarkable. It is probable that, while the intestinal contents were in small quantity, and the action extremely moderate, the diseased portion was able to act in concert in the natural and healthy manner, but that, when a certain greater degree of dilatation took place in the parts above, a corresponding dilatation could not be communicated downwards, and an interruption occurred which occasioned the paroxysms of pain. The over distention, in these cases, was after a certain time removed, until at last, from some cause which eludes observation, it took place in a greater degree, which was not recovered from, but, passing into inflammation, was fatal. In Case 11 it is worthy of observation, that the mere distention was fatal; the appearance of inflammation being so slight and recent, that it could not be considered as the cause of death.

### SECT. III.—*Ileus, with Mechanical Obstruction.*

On this part of the subject, I shall do little more than relate a few remarkable examples; and they are referable to three heads, contraction of the intestinal canal,—*intus-susceptio*,—and internal hernia.

CASE 13.—A man, aged 70, a tailor, had complained for several



weeks of a deep-seated pain, referable to a particular spot at the lower part of the abdomen; but it was not so severe as to prevent him from following his usual occupations. On 27th July 1815 he was seized with violent pain of the belly, vomiting, and costiveness; on 28th, belly became swelled, tender, and tympanitic; pulse natural; 30th, some feculent discharge was procured; pulse about 100. Died rather suddenly on 31st.

*Dissection.*—The whole of the small intestines, and the colon, were in a state of uniform distention, and of a dark colour. The distention stopped at the second turn of the sigmoid flexure, before it turns down to terminate in the rectum. Here the intestine was for about an inch and a half very much thickened in its coats, and its area was so diminished as scarcely to admit the point of the little finger. The inner surface of this portion was covered with red fungous excrescences, like granulations; much feculent matter was collected above this place. There was no adhesion in the other parts of the intestine, nor any appearance of active inflammation; but a dark leaden colour was nearly uniform over the whole of it.

CASE 14.—A woman, aged 60, had complained for some time of frequent uneasiness in her bowels, with flatulent distention.—27th August 1817. Uneasiness increased; no stool for four days; but no violent symptoms. From this time, she resisted every remedy, but still without any violent symptoms; the belly became gradually more and more enlarged, but there was no fixed pain, only occasional griping; no fever; no tenderness, and little vomiting. She died on 4th September, having lain for the last three days in a state of extreme lowness, with coldness of the whole body. *Dissection.*—The whole tract of the intestinal canal was prodigiously distended, and there was, in several places, recent inflammation, with exudation of coagulable lymph. The disease extended to the rectum, about four inches from the anus, where the intestine was so contracted as scarcely to admit the point of a small finger. Behind this spot, there was a mass of diseased glands, and the contraction was occasioned by a firm flat substance, which was connected with this mass, and crossed the intestine in front. This being cut through, the intestine was set at liberty, and its coats were sound.

CASE 15.—A woman, aged 22, (9th November 1818,) while sitting dressing her child, was suddenly seized with vomiting, and pain at the stomach; the pain soon after moved downwards, and fixed, with great severity, in the region of the head of the colon; the whole abdomen became painful and tender.—10th, Urgent vomiting, violent pain over the whole abdomen, with frequent paroxysms of aggravation which produced screaming; abdomen tender; pulse 120, very small and feeble; countenance extremely faint and exhausted. Died on the 13th, without any particular change in the symptoms.—*Dissection.*—Small intestine greatly distended, with a slight blush of redness in some places. About three inches from the lower extre-



mity of the ileum, there began an inversion of the intestine, to such an extent, that more than 18 inches of the ileum had passed into the cavity of the caput coli. The inverted parts were much diseased, inflamed, and gangrenous, and some portions were reduced to the state of a soft pulp. At the commencement of the inversion a portion was much thickened; the colon was healthy; there was some effusion in the abdomen.

CASE 16.—A boy, aged two years and five months, (7th May 1812,) was seized with vomiting, pain of the lower part of the belly, and tenesmus, with which he passed small quantities of bloody mucus, and some pure blood. He was hot and restless, and his countenance was anxious and depressed; pulse very frequent; abdomen, to the touch, natural. On the 8th, while straining at stool, a tumour, of a dark bloody colour, protruded from the anus to the bulk of an egg. It was easily reduced; but, on examination by the finger *in ano*, was distinctly ascertained to be inverted intestine, and a probang being carried up, passed to a great depth by its side, without reaching the commencement of it. Various unsuccessful attempts were made to restore it to its natural situation. The child died on the morning of the 9th. *Dissection.*—A most remarkable inversion of the intestine was discovered, which began at the middle of the arch of the colon, and the parts concerned in it, including the remainder of the colon and a corresponding portion of the ileum, when freed from the inversion, measured 38 inches. The part that had protruded at the anus was the inverted caput coli. The inverted portion of colon was of a dark livid colour, very soft, and, in some places, thickened. The portion of ileum included within this was healthy; a portion of omentum was also included, besides a considerable extent of mesentery. The other intestines were slightly inflamed, and there was some serous effusion in the abdomen.

I have seen another case, exactly resembling this in its symptoms, and differing from it only in the extent of the inversion, which began at the lower part of the colon. The patient was a boy aged about four years, and he survived five or six days.

CASE 17.—A girl, aged 17, (5th July 1818,) was seized with violent pain in the belly; vomiting; obstinate costiveness; pain increased by pressure; pulse frequent. Various remedies were tried without benefit; pain continued; belly enlarged. I saw her on the 9th; the belly was then enormously enlarged; very tense, and tender; no evacuation; pulse 140, and weak; features collapsed; died at night.—*Dissection.*—The small intestine was much distended and inflamed; and, in several places, had burst and had discharged much thin feculent matter into the cavity of the abdomen. At the root of the mesentery, on the right side, and on a line with the head of the colon, there was a mass of diseased glands, the size of a large egg. To this mass, the appendix vermiformis had contracted a very firm adhesion by its apex, and as it stretched across from the caput cæcum to



the mass of glands, it left beneath it a space which admitted three fingers. In this space a turn of intestine, about six inches in length, was strangulated and gangrenous.

CASE 18.—A man, aged 28, (15th August 1815,) was suddenly seized with pain of the belly and frequent vomiting. 16th. Symptoms continued, with hiccup; pulse natural; no stool. 17th. Symptoms abated, but no stool; pulse natural. 18th. Severe vomiting and hiccup; features collapsed; a good deal of pain, but not increased by pressure; pulse 90; died in the night.—*Dissection.*—There was a hard mass of considerable size formed by disease of the mesentery. To this mass several turns of intestine had contracted adhesions of long standing, and, at these points, the coats of the intestine were much contracted by bands of adhesion, and the cavity diminished; at one point, it would only transmit a directory. At one place, a portion of intestine adhered to the diseased mass at two points, leaving betwixt them a space which admitted a finger; in this space, a small portion of a contiguous turn of intestine was strangulated. In the upper part of the small intestine, before these adhesions commenced, there was distention and gangrene; below, it was healthy, except several narrow bands of adhesion in several places betwixt contiguous turns. About two years before his death, this man had been for some months in very bad health, being affected with a deep-seated pain in the abdomen, want of appetite, great weakness, and emaciation. He went to the country, and got well. After that time he enjoyed tolerable health, except two attacks of pain of the belly, and vomiting, which were of short continuance; the second was about a fortnight before the fatal attack, and was relieved by a dose of castor oil.

The following case differs from these examples of ileus. I add it here as a remarkable example of inverted peristaltic motion,

CASE 19.—A man, aged 53, a marble-cutter, (May 1814,) was affected with vomiting and uneasiness in the bowels, which attacked him in the following manner: The attack commenced with a sense of commotion, or, as he termed it, “a working,” which began at the very lower part of the belly, and rather to the left side. It moved gradually upward till it reached the stomach, and then he vomited every thing that he had taken since the last attack. He was attacked in this manner at uncertain intervals, several times every day, and the complaint had continued about a fortnight. He had been for 15 years affected with a small hernia of the left groin, which often came down, but was easily reduced. He had used a truss, for the first time, a few weeks before he applied to me. From that time his hernia had never appeared, but very soon after he applied the truss, the above mentioned complaint began. There was no fixed pain in the belly; his pulse was natural; his bowels costive, but not obstructed.



A variety of remedies was employed without benefit. For a month after I saw him first, he continued to attend to his work. He was then confined to his house, and soon after to bed, with increasing debility and emaciation, without any change in the complaint; his hernia never appeared; his pulse was generally natural; his bowels were easily kept open; his belly, to the touch, quite natural, rather collapsed, except at times, when a circumscribed hardness was to be felt in it, but this was not always felt in the same place, and often not felt at all. He was liable to violent paroxysms of pain in the abdomen, which affected sometimes one part of it, sometimes another, and he died of gradual exhaustion, about ten weeks from the commencement of the vomiting. *Dissection.*—The hernia was found to have been femoral; a portion of the sigmoid flexure of the colon adhered to the mouth of the sac, and a fine ligamentous band, connected at its extremities to the mouth of the sac, surrounded the intestine at this spot, but without producing a great degree of constriction,—the area, to the extent that the band admitted of its dilatation, being free, and the coats of the intestine healthy. There was intus-susceptio of considerable extent in two places of the small intestine, and the lower end of the ileum was inflamed. The colon was collapsed; the pylorus was hard, and a little thickened; the inner surface of the stomach, at the pyloric extremity, was considerably eroded.

The following case exhibits another modification of the symptoms.

CASE 20.—A woman, aged 63, enjoyed tolerable health, till within three months of her death. She then had vomiting and costiveness for a week, and was relieved by purgatives. She then complained of nausea without vomiting; no pain; the belly was at first tumid, but afterwards subsided. After a month she was confined to bed, but complained of nothing except constant nausea, and increasing debility and emaciation. Bowels very costive; no organic disease to be detected. She had repeated attacks of vomiting, which sometimes continued for several days. In the intervals she lay without complaint, except nausea and want of appetite, till she died of gradual exhaustion. Her bowels had been kept open by injections, purgative medicine being vomited. *Dissection.*—There was a great thickening and induration of the coats of the ileum at its termination in the colon, which so narrowed the opening, that it only admitted the point of the little finger. The ileum was distended and dark-coloured, the other viscera healthy.

On a review of the whole phenomena of ileus, as they are presented to us in these cases, there are various principles, pathological and practical, which seem to result from them. Some of these may be considered as legitimate conclusions; others I submit for farther investigation.

1. It is probable that the morbid condition which constitutes



ileus, is the distention of a portion of the intestinal canal beyond its power of contraction.

2. It is probable, that, when a considerable extent of the canal has fallen into this condition, it may in that state be fatal without farther disease.

3. The usual progress of the unfavourable cases is to inflammation and its consequences; and we have seen the disease fatal, while the inflammation was in various stages of its progress, from a slight blush of recent redness to extensive mortification. Farther, we have seen remarkable varieties in regard to the period of the disease when the inflammation appears. It seemed to be quite recent in Case 2d, which was fatal on the 9th day, and in Case 11th, which was fatal about the 13th. On the other hand, in Case 4th it had passed on to extensive gangrene on the third day.

4. It is probable that ileus is not necessarily connected with obstruction of a part of the canal, for we have seen it occur without obstruction, and in connection with causes which did not seem calculated to produce obstruction; and in one case we have seen the obstructed part dilated by mechanical means without relieving it.

5. Ileus does not appear to be necessarily connected with feculent accumulation, or with any condition of the contents of the canal, for we have seen it fatal while these contents were of a natural appearance, almost entirely fluid, and in very small quantity.

6. Pain of the abdomen, increased upon pressure, does not appear to be a certain mark of inflammation. It occurred in Case 1, where there was no inflammation, and in several other cases at an early period, before probably the inflammation had commenced. From various observations I am satisfied, that intestine which has been rapidly distended, is painful on pressure; it is, however, a kind of pain which by attention can in general be easily distinguished from the acute tenderness of enteritis.

7. Cessation of the pain, and great sinking of the vital powers, are not certain indications of gangrene; for in Case 2d these symptoms were connected with recent inflammation; and in Cases 7th and 21st, they were recovered from. To this important subject I shall have occasion to refer more particularly when I come to the subject of enteritis. I shall then mention several cases in which recovery took place where the symptoms usually considered as indicating gangrene had occurred. On the other hand, in Cases 3d and 4th, in which there was extensive gangrene, the pain continued violent to the last.

8. The pulse appears to be rather an uncertain index of the

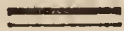


condition of the parts in ileus. In Case 2d, in which there was considerable inflammation, it was less affected than in Case 1st, in which there was none. In Case 14th there was neither frequency of pulse nor tenderness of the belly, though there was inflammation, with exudation of very considerable extent. Other interesting circumstances in regard to the pulse may be remarked in the cases. One of the most important is in Cases 4th and 9th, which were fatal, with extensive inflammation and gangrene, within eight or ten hours after the time when the pulse was first observed above the natural standard.

9. In cases of Ileus, we must be cautious of forming a favourable prognosis from the appearance of feculent evacuations. These, we have seen reason to believe, may occur while the disease is going on to a fatal termination, and much feculent matter may lodge in the lower part of the intestine which is healthy, and may be brought off while the disease above remains unchanged.

10. Organic disease of considerable extent may exist in the bowels without giving rise to any urgent symptoms, until at length, from some cause which eludes observation, it suddenly produces fatal ileus. Cases 13th and 14th.

11. On the other hand, such organic disease may be fatal without ileus. Cases 19th and 20th.



#### OUTLINE OF THE TREATMENT OF ILEUS.

IF the principles which I have proposed in this paper shall be considered as worthy of any credit, it will follow, that ileus is not an accumulation to be forcibly removed, nor an obstruction to be forcibly overcome, but a muscular organ to be restored to its healthy action. In the treatment there would be three distinct objects of attention,—the part which is distended beyond its power of contraction,—the healthy part above,—and the healthy part below, which is contracted and empty. Those principles, however, I only propose at present for further investigation, and do not presume to think them so established as to be applied to the treatment of ileus. But there are some points in regard to the treatment which present a most interesting field of investigation, and on which I would propose a few observations. One of the most important of these relates to the use of purgatives in ileus, and the question, Whether, in every case, the use of active purgatives be advisable? The action of purgatives must be chiefly and primarily upon the



healthy part of the canal above the seat of the disease; and the important question, in regard to this portion, is, Whether, in every case, it requires to be excited; or whether there are not modifications of the disease in which its action is already as great as can be desirable, and even some, in which it might be moderated with advantage? The violent tormina occurring in paroxysms, which we observe in many cases of ileus, certainly give reason to believe, that there is not any deficiency of action in the higher intestines, but rather a violent action, resembling that which is produced by a purgative,—a strong though ineffectual effort to overcome some interruption to the healthy action of the canal. Now, if a part of the canal be really in a state of inaction from over-distention, and if the action of the healthy part above fails in relieving it in the manner which I have already supposed, may we not conceive a case in which it is actually increasing it,—in which, by propelling new matter into the distended part, it is presenting an obstacle to this part recovering its healthy action. In such a case, might not benefit be obtained from allaying the action of the upper part, instead of increasing it? I think there are circumstances in the history of ileus which give some probability to this conjecture. Several of the remedies which are beneficial, are such as are calculated to allay muscular action; among these may be reckoned blood-letting, cold applications, and tobacco injection; and I have seen a severe case of ileus yield in a few hours after the use of a full dose of opium, which had for several days resisted the most active remedies. I by no means intend to say, that this principle is applicable to every case, but, from the whole phenomena of ileus, I do suspect that there are most important differences in the circumstances of the disease in different cases; particularly that there are some cases in which the upper part of the canal requires to be excited; others in which its action is already sufficient for every purpose that it can be supposed to answer; and some in which it may even require to be moderated. I think there is also some reason to suppose, that, in the cases which require the use of purgatives, there are important differences in the degree of excitement that is adapted to each,—that in some, the most active medicines are requisite, while in others, the mildest in very moderate doses, produce that beneficial action, which, by a stronger excitement, would be defeated. These remarks are not entirely hypothetical. The most accurate observers have often been heard to remark, that there are facts in the history of ileus which seem to be totally at variance with our ordinary ideas in regard to the action of purgatives,—that very mild medicines seem, in



many cases, to answer better than the more active,—and that the beneficial result sometimes follows the very mildest in very small doses, after the most powerful in immense quantities have been given in vain. I am aware of a source of fallacy which is inseparable from such observations, but I conceive they are by no means to be disregarded; and when we add to them the fact, that a full dose of opium is sometimes followed by the result which we have sought for in vain from the most powerful purgatives, I submit, whether the whole phenomena of the disease do not give considerable probability to the principles which I have proposed. In regard to the use of purgatives, I suspect, that the best practice in general is to give mild medicines in moderate doses, repeated at very short intervals, while, at the same time, we keep in view, that the use of purgatives is but a part of the treatment, and that the main object is to remove, if possible, that condition of the canal, as a muscular organ, by which purgatives are prevented from producing their usual effects. Every one, indeed, must have experienced, that, in regard to the use of purgatives, there is a point in the treatment of ileus when he is often brought completely to a stand, when he is convinced that it is in vain to urge them farther, and is led to look around for remedies calculated to act upon some other principle. Important remedies of this kind are blood-letting, blistering, and the effectual application of cold, either externally, or by glyster; but, as far as my observation extends, the remedy of most general utility is the tobacco injection. It should be begun with caution; perhaps for an adult in the quantity of 15 or 20 grains infused in four or six ounces of hot water. After the interval of an hour or two, it may be repeated in a quantity a little larger, until such effects are produced by it, viz. slight giddiness and muscular relaxation, as shew that it is exerting its proper effect upon the system. It may then be repeated at proper intervals a great many times, if the case do not yield. With these precautions I have given it in states of great nausea and exhaustion, with the effect of diminishing instead of increasing them, and, in one case, to a child three years of age, with the happiest result. In one of the most severe and obstinate cases I have had occasion to treat, it was repeated nearly twenty times with various partial effects, and at length with complete success. The obvious effect of this remedy upon the system, is to produce relaxation of all muscular parts, and the mode of its operation in ileus is involved in considerable obscurity. I have supposed, that, in this disease, the upper part of the canal is healthy, sometimes in strong action,—that a part below this is inactive from distention,—and that the lower part



is healthy and contracted, being kept in that contracted state by its tonic power, and the suspension of the action by which, in the healthy state of the parts, it would have been distended. A certain force is, indeed, acting upon it by the propulsion of matters from the upper part, but this acts with little effect after being communicated through the intermediate portion, which is in the state of an inanimate canal. It is, therefore, unable to overcome the tonic contraction of the lower part, which thus opposes an obstacle to the parts recovering their healthy relations. The same observation applies, if we suppose, that the distended part itself retains some degree of action, though feeble and imperfect. Now, in this state of the parts, could the tonic power of the lower part be for a time considerably diminished, it might perhaps be brought, as it were, more into unison with the other parts,—might be dilated in the natural manner by the weakened force which is acting upon it,—and the parts might thus be enabled to recover their healthy relations. Is this the action of the tobacco injection?—It is mere conjecture, and I urge it no farther. I add the following case, illustrating the effect of this remedy in a state which seemed to be nearly hopeless, and exemplifying an important fact to which I have already alluded,—that symptoms resembling those of gangrene may be recovered from.

CASE 21.—A woman, aged 20, (17th November 1813,) was affected with violent pain in the right side of the abdomen, and obstinate costiveness; pulse natural; had been ill three days; used purgative medicine and injections with some relief.

18th.—Pulse 96; urgent vomiting; pain of abdomen violent; was bled and blistered, and purging injections repeated.

19th.—Pulse 120; no stool; no relief; pain violent over the whole abdomen; urgent vomiting. Was bled again; various medicines given without effect; every thing was vomited. Towards the afternoon, the pain nearly ceased, with collapse of the features, and coldness of the surface; pulse 140, and very weak; vomiting continued; appeared to be moribund. Wine was now given, about a glass every hour. After a few hours, her appearance being improved, the tobacco injection was given at first in small quantity, and it was repeated several times. It did not increase the sinking, but seemed rather to abate both it and the vomiting; wine continued.

20th.—Pulse improved; some scanty evacuations; tobacco injection given several times with partial effect; vomiting abated; some Epsom salt was retained, and operated; free from pain; pulse 96.

21st and 22d.—Continued to improve; pulse 80; bowels kept open by small doses of Epsom salt. From this time continued well.

I have already alluded to the effects of blood-letting, and the application of cold. In the state of collapse produced by a full



bleeding, I have repeatedly seen the disease give way so suddenly, that there was no time to raise the patient out of bed. If there are symptoms indicating inflammation, this remedy of course must be urged in the most decided manner. In regard to the remarkable effects of cold, I refer to a valuable paper by Mr Smith of Kingussie, in the 9th Volume of this Journal, page 287. Of the other remedies that have been proposed, I have had little experience. Crude mercury in doses of lb. i. or more I have tried in several cases. In some of them, it appeared to abate the vomiting. I have not observed any other effect from it, and I am not convinced that the principle on which it is given is correct. In the Memoirs of the Medical Society of London, Vol. II. some remarkable cases are described, in which the forcible injection of fluid to the extent of six or eight pounds, was used with advantage.

Whatever practice is employed ought to be zealously persevered in, notwithstanding the most unfavourable appearances; for the disease has been known to resist for a long time the most active remedies, and yet terminate favourably, as late as the 17th day.





*With the Authors last Complete*

# RESEARCHES

ON THE

PATHOLOGY OF THE INTESTINAL CANAL.

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PART II.

ON THE INFLAMMATORY AFFECTIONS.

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# RESEARCHES

ON THE

## PATHOLOGY OF THE INTESTINAL CANAL.

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### PART II.

#### ON THE INFLAMMATORY AFFECTIONS.

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**B**ETWIXT a fatal case of ileus, and a fatal case of enteritis, there is usually a considerable similarity in the morbid appearances which are observed on dissection. In both we generally find a portion of intestine in a state of distention, and the distended part is more or less inflamed, with exudation of coagulable lymph, lividity, or gangrene. But when we trace more accurately the history of the two affections, we discover an important difference. We find reason to believe that ileus may be fatal in the state of distention without inflammation, and that enteritis may be fatal without distention; or, in other words, that the distention is the primary disease in the one, and in the other, the inflammation. In a former paper I have endeavoured to trace the pathology of ileus, and I have proposed various conjectures in regard to the nature and origin of the

disease. I conceive it is to be viewed as the disease of a muscular organ, originating in a part of that organ being distended beyond its power of contraction. A muscular organ thus distended passes into inflammation, as we observe in the urinary bladder. One of the sources of this distention I have supposed to be, such a debilitated state of the muscular fibres at a particular part of the canal, that they are distended before that impulse from the healthy parts above, which in their natural state would have excited them to contraction. Now, nothing, I imagine, is more likely thus to destroy the action of muscular fibre than inflammation. I do not mean to enter upon the question, whether this be a primary or a secondary effect of inflammation, but we have, in various parts of the body, ample evidence of the fact, that muscles which have been inflamed, are much impaired in their muscular action, and often completely paralyzed. If we suppose, then, a portion of the muscular coat of the intestinal canal to be thus weakened or paralyzed by inflammation, and that the healthy parts above are forcibly propelling fluid matters and flatus into this portion, we readily conceive how it is distended before this force, and the case then assumes the usual appearances of ileus. Enteritis, then, or primary inflammation of the intestinal canal, may be said to be one of the causes of ileus, or, in other words, to terminate in ileus; while, on the other hand, ileus originating in other causes, usually terminates by inflammation of the distended part; and thus the two cases, which differ widely at their commencement, are, at their termination, remarkably similar.

If these principles be correct, it will follow, that the symptoms and the morbid appearances of ileus will accompany enteritis only when the inflammation is seated in the muscular coat; and this leads us to a most important distinction in the inflammatory affections of the intestinal canal, both in regard to the seat of the inflammation, and the symptoms which accompany it. In regard to the former, we shall see reason to believe, that the inflammation may be primarily seated either in the peritonæal, the muscular, or the villous coat, giving rise to important diversities in the symptoms, and that it may spread from one structure into another, producing remarkable changes of the symptoms, at different periods of the same case. Thus, while the inflammation is confined to the peritonæal coat, it is probable that the disease may go on without interrupting the muscular action of the canal, or that the irritability of the muscular fibres may even be increased, so as to occasion diarrhœa. When the inflammation, again, is in the villous coat, the mus-



cular action may also be unimpeded, and may be still more likely to be increased; but when the inflammation in either case extends to the muscular coat, the symptoms pass into those of ileus.

These conjectures correspond with the phenomena which we observe in diseases of this class. We find inflammatory symptoms in the abdomen, connected with a natural and healthy state of the action of the intestinal canal; and we find them connected with diarrhœa. In both these conditions, the disease may be fatal without interruption of the intestinal action, and yet proofs of most extensive inflammation may be found on dissection; and, on the other hand, a case may begin with a natural state of the bowels, or with diarrhœa, and, at a more advanced period, may pass into ileus. In connection with these varieties in the symptoms, we find, in the fatal cases, diversities equally important in the morbid appearances. In many we find gangrene combined with deposition of coagulable lymph; but in some we find extensive gangrene without this deposition, while, in others, we observe such deposition in great quantity, without the slightest appearance of gangrene. Now, the deposition of coagulable lymph is probably to be considered as the result of inflammation of the peritonæal coat, while the muscular coat, I imagine, is to be viewed as the seat of gangrene. The two appearances, indeed, are very often combined, but, if this distinction be correct, it will furnish us with a criterion by which we may judge, in many cases, of the primary seat of the disease, and some singular facts occur as the result of this investigation. In those cases which are primarily inflammatory, that is, distinguished from the commencement by pain, tenderness, and fever, gangrene is not so frequent as we are apt to suppose; and it very rarely occurs uncombined with gelatinous deposition; while in those cases which begin as ileus, that is, with obstruction of the bowels, without fever or tenderness, gangrene will be found to be very common, and frequently to occur without gelatinous deposition. But, farther, it will be found, that, in several of the cases which terminated by exudation without gangrene, there was no obstruction of the bowels, or not till an advanced period of the disease, while the symptoms of ileus had existed from an early period in those cases in which there was extensive gangrene: and in case 9th, in which there were both extensive exudation and gangrene, the intestinal action was at first natural, and afterwards there occurred symptoms of ileus. These results are curious, and if they shall be verified by farther observation, they are important. They give considerable probability to the conjectures



which I have proposed in regard to the pathology of these affections,—that the inflammation may affect the whole structure of the canal, or may be confined to one of the coats ;—that, when it affects the muscular coat, obstruction takes place, but that, when it is confined to the peritonæal coat, the muscular action of the canal may go on without interruption ;—that the proper termination of the disease in the peritonæal coat is gelatinous exudation, in the muscular gangrene.

These principles I propose for farther investigation ; and I shall at present only add a comparative view of the cases of ileus and of inflammation, which will be found in this and the preceding paper. Setting aside the cases which were connected with mechanical obstruction, I have described eight fatal cases, which were selected as exhibiting the symptoms of ileus without primary inflammation. Of these the terminations were the following :

Distention without inflammation in	-	1
Distention with inflammation, slight, and quite recent,	2	
Gangrene without exudation,	- - -	2
Gangrene with slight exudation,	- - -	3

In this paper I shall describe eight fatal cases, which were selected as exhibiting primary symptoms of inflammation ; and of these the terminations were,

Extensive exudation, without gangrene,	-	5
Exudation, accompanied with gangrene,	- -	3

In none of the former was there exudation without gangrene, and in none of the latter was there gangrene without exudation. I exclude from this comparison the remarkable case, (case 11th,) because I conceive that in it the affection of the bowels was not the fatal disease. It is highly valuable, as shewing the state of the parts when a severe attack of this kind had been recently recovered from.

These cases were originally arranged, according to their symptoms, under the two heads of ileus and inflammation, without any attention to the mode of their termination ; and it was only after the first series was printed that this peculiarity in their terminations occurred to me ; for, in arranging the cases of this second part, and searching for a case of primary inflammation which was fatal by gangrene without exudation, I found that I had no such example. The subject is worthy of careful investigation. It is a remarkable fact, that in all the inflammatory cases there was exudation of considerable extent ; that in more than half of them it was the only morbid appearance, and



a prominent appearance in all; that of the cases of ileus, again, three were fatal without either exudation or gangrene; that gangrene occurred in all the remaining cases as the prominent appearance, and the only appearance in two out of five. The following conclusions from these facts I state at present merely as conjectures.

1. In all the cases which exhibited symptoms of primary inflammation, the peritonæum seemed to have been extensively affected; and in various parts of the body we see reason to believe, that the symptoms accompanying inflammation of membranous parts are more acute than in any other structure. Is it, then, probable that, in the acute affections of the bowels, the inflammation is primarily seated in the peritonæal coat?

2. In several of the cases of ileus which were fatal by extensive gangrene, there had been no primary symptoms of inflammation, and in some of them not till a very short period before death. Is it, then, probable, that inflammation may exist in the muscular fibres without producing acute symptoms, and distinguished only by symptoms of ileus, and that, in these cases, the symptoms of acute inflammation supervene when the inflammation extends to the peritonæal coat? Were this rendered probable, it would add considerably to our pathology of ileus, and would throw much light on the action of several remedies which are found efficacious in producing very sudden resolution of the disease, such as large bleeding and the application of cold. It would, however, still be probable that there are cases of ileus which proceed from other causes, and require a different treatment. The subject is most important. Much observation is required to throw light upon it.

3. I shall afterwards give my reasons for believing that inflammation may exist in the peritonæal coat without producing very violent symptoms. If, therefore, each of the two structures may be separately affected, and with this diversity of symptoms, it will be probable that it is when the inflammation affects both the peritonæal and muscular coats at once, that we find the combination of inflammation and ileus, which we express by the term Enteritis. It is in this sense that I mean to use the term Enteritis in the following part of this paper.

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## SYMPTOMS OF INFLAMMATION IN THE INTESTINAL CANAL.

### SECT. I.—*Inflammation confined to the Peritonæal Coat.*

The title which I have placed at the top of this section, I merely propose as expressing the opinion which I have been



led to form in regard to the nature of the insidious and dangerous disease which I mean to describe. It differs so remarkably from the disease which is usually described under the name of Enteritis, as fully to merit a distinct investigation.

The disease begins with pain in some part of the abdomen, varying very much in its seat, its degree, and its general characters. It is sometimes nearly general over the abdomen, and sometimes confined to a particular part, as one side of the abdomen, or very frequently to the lower part, immediately above the pubis. It is increased by pressure, and, in some cases, it is little complained of, except when pressure is applied, being rather acute tenderness than actual pain. In other cases there is acute pain, which comes on in paroxysms, very violent while it continues, so as probably to occasion screaming, but going off completely after a short time, leaving only the tenderness on pressure, which is sometimes in such a degree that the weight of the bed-clothes gives uneasiness. Yet, notwithstanding this tenderness, the patient may be, during considerable intervals, free from any acute pain when he lies perfectly still, but it is excited by various exertions, as coughing, sneezing, a full inspiration, and by any motion of the body.

According to the seat of the disease, various neighbouring organs are affected. When it is in the lower part of the abdomen, it is generally accompanied by frequent painful desire to pass urine, and an acute pain extending along the urethra. Sometimes the secretion of urine is greatly diminished, or nearly suspended. There may be along with this such frequent desire to pass it as leads to the suspicion of retention, but the catheter being employed in such cases, the bladder is found empty. When the disease is in the upper part of the abdomen, there is frequently vomiting, and sometimes a peculiar convulsive eructation or belching of wind, which continues without intermission for a considerable time. But vomiting is not a regular symptom, and seems only to occur when the disease is in the upper part of the canal. Sometimes we observe hiccup and quick short breathing, probably connected with an affection of the diaphragm. The pain sometimes suddenly shifts its place, as from the region of the stomach to that of the bladder, or from one side of the abdomen to the other. In some of these cases it leaves its former seat, in others, both continue to be affected at once.

The pulse is frequently little affected, especially in the early stages. It may be from 80 to 90, or 96, but is sometimes scarcely above the natural standard. The state of the bowels varies considerably; but a leading peculiarity of the disease is,



that they are not obstructed. Sometimes there are frequent calls to stool, with scanty slimy discharges, sometimes a more copious diarrhoea, with much pain and straining, but very often, perhaps most commonly, the bowels are in a natural state, being readily moved by very mild medicines. These evacuations, however, produce no relief; on the contrary, the patient generally complains of violent pain during the operation of the mildest purgative, and after the operation is over, all the symptoms are found to be increased.

Such are the general characters of this affection. It differs from enteritis in the bowels being natural or loose; the pulse being little affected; the pain often occurring in paroxysms, so as to be mistaken for a spasmodic or flatulent affection; and in the absence of vomiting, except in certain cases formerly referred to. These peculiarities are chiefly observed in the early stages; as the disease advances they usually become less remarkable; the pulse rises, the pain becomes more fixed and permanent, the belly becomes tympanitic, and, at a certain period, obstruction takes place, and the case passes into all the usual symptoms of enteritis. It may, however, be fatal without this change; the bowels continuing regular, and the pulse from 80 to 90, until a very short time before death.

The disease, as will be seen from the cases, may be fatal in three days. On dissection we find uniformly effusion of coagulable lymph; in some cases very extensive, and frequently effusion of a turbid or puriform fluid, sometimes in considerable quantity. Gangrene is rare; and, as far as my observation extends, never occurs as the prominent appearance; it being, when it does occur, slight and partial, and always accompanied by extensive deposition of coagulable lymph. I have stated my conjectures in regard to the nature of this disease. I conceive it to be inflammation, confined to the peritonæal coat, and that, in consequence of this, the muscular action of the canal is not impeded. It may continue a considerable time, and perhaps be fatal in this state, or it may spread to the muscular coat, and give rise to the usual symptoms of enteritis.

Inflammation of the peritonæum may occur in a more limited form than in the disease which I have now described, and, according to the seat of it, may assume the appearance of disease of various organs, as the bladder, the kidney, the liver, or, when seated in the membrane covering the diaphragm, may simulate disease of the lungs. I think I have seen it in one case seated in the ligaments of the liver, and giving rise to very obscure and anomalous symptoms. When it occurs in the neighbourhood of the kidney, I think it may induce the proper



Ischuria Renalis, which is usually fatal by coma and effusion in the brain. I do not know whether inflammation may be seated in the peritonæum lining the parietes of the abdomen, without affecting the intestinal canal. I have seen some cases which I supposed to be of this nature, but I have not ascertained it. The cases to which I refer terminated favourably.

SECT. II.—*Inflammation confined to the Muscular Coat.*

There is much obscurity in the pathology of muscle, particularly in regard to the effect of inflammation on muscular fibre. Perhaps we have been too much in the habit of passing over the investigation by an indiscriminate application of the term Rheumatism. We cannot doubt that muscular fibre is liable to gangrene, but rheumatism never terminates in gangrene. It is probable, then, that muscular fibre is liable to an inflammation differing materially from rheumatism. The most remarkable example of it in the extremities is in the high inflammation which follows compound fractures, and which often terminates in extensive gangrene. We see it also in the psoæ muscles, where it generally terminates by suppuration; sometimes of such extent that every trace of muscular fibre has been lost, nothing being left but the sheath, full of purulent matter.\* Though the subject be extremely obscure, I think we are warranted in supposing that the muscular fibres of the intestinal canal may be the seat of inflammation, and that it may terminate in gangrene. I have already mentioned the circumstances which induce me to conjecture that inflammation in the intestine may be confined to the muscular coat, that it sometimes exists there producing ileus, but not accompanied by symptoms of active inflammation. Did this take place in the remarkable case, (Case 3d of my former paper,) in which there was extensive gangrene, though there had been no symptom of active inflammation till a few hours before death? It is mere conjecture, but it is a point highly deserving of minute investigation.

SECT. III.—*Inflammation affecting the Muscular and Peritonæal Coats at once.*

I think we may consider it as fully ascertained, that extensive inflammation may exist in the intestine without producing ob-

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\* See Thomson's Lectures on Inflammation.



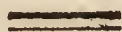
struction or symptoms of ileus; and it is highly probable, that, in such cases, the inflammation is confined to the peritonæal coat. On the other hand, we have seen that ileus may exist without inflammatory symptoms, while an inflammatory action seemed really to have been going on, which was probably seated in the muscular coat. When both these structures are affected at once, I think there is produced the genuine enteritis, which may be designated as a combination of the symptoms of active inflammation, with symptoms of ileus;—tenderness of the abdomen and fever, with obstruction of the bowels and vomiting. If these principles are correct, it will follow, that enteritis may appear under three forms, and this division seems really to correspond with the phenomena which meet us in the history of these affections. (1.) The disease may begin in the muscular coat, (whether originally inflammatory, or consisting of loss of action from other causes,) and may at an advanced period affect the peritonæal coat. In this case the symptoms will be first those of ileus, afterwards passing into those of active inflammation. (2.) The disease may begin in the peritonæal coat, and afterwards extend to the muscular, in which case there will be the symptoms of peritonæal inflammation passing into enteritis. This form of the disease is exemplified in Case 9th, and the appearances are such as we should expect upon the principles which I have proposed; extensive exudation of coagulable lymph combined with gangrene; and in Case 10th, in which there was the same course of symptoms, but fatal without gangrene. (3.) Both structures affected at once producing the genuine enteritis.

#### SECT. IV.—*Inflammation of the Villous Coat.*

This subject presents a most important field of investigation, in which hitherto little has been done. The appearances are generally, a considerable portion of the inner surface of the intestine covered with irregular patches of inflammation. These are of various extent, and are often sensibly elevated above the level of the surrounding parts. Sometimes they present on their surface numerous small vesicles, and at a more advanced period these seem to pass into minute ulcers. The symptoms appear to vary according to the seat of the disease; when it is in the lower part of the canal they seem to be nearly allied to dysentery. When it is in the small intestine there is generally a peculiar painful diarrhœa, in which watery matters pass through in large quantity, with much pain and straining, any thing taken into the stomach exciting an irritation which



continues till it be thrown off. There is generally fever and thirst, and sometimes vomiting. It appears to be a common and fatal disease of infants, not easily distinguished in its early stages from their common bowel complaints,—very untractable, and frequently terminating by coma. In adults the disease occurs both in an acute and chronic form. The latter I suspect is not uncommon. I shall afterwards describe several examples of it, both in the state of simple inflammation and ulceration. The former, I believe, is more uncommon in adults as an idiopathic disease, but it seems to occur as a symptomatic affection in cases of malignant typhus. I mean afterwards to attempt an outline of this important subject, and only refer to it here in this superficial manner, in connection with the subject of this paper, to introduce the remarkable case (Case 13th) in which this affection seemed to pass into enteritis.



## EXAMPLES OF THE LEADING VARIETIES OF INFLAMMATION OF THE INTESTINAL CANAL.

### I.—Extensive Peritonitis with Diarrhœa.

CASE I.—A woman, 30, a servant, unmarried, after being feverish for a day or two, was seized, on 8th December 1817, with diarrhœa, accompanied by considerable pain. On the 9th the diarrhœa continued; the pain was severe, and was increased by pressure. Pulse 90. Took some purgative medicine, which was vomited, and at night was bled to  $\frac{3}{4}$ xii. I saw her for the first time on the 10th, when I found her sinking. Pulse very frequent, and feeble; features contracted; a good deal of pain; some vomiting; belly tympanitic. Died at night. *Dissection.*—There were most extensive marks of peritonæal inflammation; nearly the whole surface of the intestinal canal being covered by a coating of coagulable lymph, which extended also over the convex surface of the liver, and over the whole surface of the spleen. It was in greatest quantity about the right side of the colon.

To this very important case I consider the two following as analogous.

CASE II.—A girl, aged 16, had been for a week or two observed to be considerably fallen off in her appearance, and was affected with diarrhœa, which was frequent and severe, and had resisted various remedies. (4th September 1819.)—The diarrhœa continued, with considerable pain, which was most severe round the umbilicus. The



abdomen was tense and painful on pressure ; the tongue was clean ; the pulse rather frequent ; but the appetite was unimpaired, and the girl was going about her usual employments. She took some opiates, and a blister was applied to the abdomen. (5th.)—Little change. (6th.)—Pain more severe ; twisting round the umbilicus, and much increased by pressure. Diarrhœa increased ; evacuations watery, copious, and rather dark-coloured ; pulse 120, and small ; abdomen tense, and a little tumid. Was bled to  $\frac{3}{4}$ xv. (7th.)—Symptoms much relieved. Blood buffy and cupped. From this time she continued to improve till the 14th, when the pain suddenly returned with great severity, increased by pressure, and accompanied by dysuria. Bowels open ; pulse 112, and small. Was bled to  $\frac{3}{4}$ xv. (15th.)—Pulse 100 ; pain in the region of the bladder, extending along the urethra, with dysuria ; bowels moved repeatedly and copiously ; evacuations pretty natural ; abdomen still tender. Was bled to  $\frac{3}{4}$ xii., and blistered. Blood buffy and cupped. (16th.)—Symptoms relieved ; took an opiate. Pulse being still frequent, began to take digitalis, and in a few days was free from complaint.

CASE III.—A lady, aged about 40, complained of frequent diarrhœa, accompanied by violent pain over the whole abdomen, especially the lower part. The pain was aggravated before the evacuations took place, but it was never gone, and it was sometimes aggravated without evacuation ; it was increased by pressure. Pulse about 108 ; tongue dry, with thirst ; no vomiting. Evacuations extremely frequent, copious, and varying in appearance, being sometimes dark, watery, and offensive, sometimes whitish. I have no notes of the particular details of this case. It was treated by blood-letting, which was repeated three times ; the pulse then came down, and the pain and tenderness of the abdomen were removed, after which the natural state of the bowels was restored by the usual means.

## II.—Peritonitis with a Natural State of the Bowels.

CASE IV.—A girl, aged 15. On Sunday, 2d March 1817, was at church in her usual health ; in the evening complained of some pain of the abdomen. (3d.)—Had pain of the belly and some vomiting ; took castor oil, which operated copiously. (4th.)—Pain continued, with some vomiting, but not urgent, and the complaint excited no alarm. Bowels open. Was seen by a medical man, who found her pulse 116, and very small, and the belly painful on pressure. (5th.)—Belly tense and tympanitic ; symptoms not relieved. Was bled without benefit. Sunk rapidly, and died at night. I did not see this case during the life of the patient. I was present at the examination of the body. *Dissection.*—On opening the abdomen the whole of the small intestines presented one smooth uniform surface, being firmly glued together, and the interstices filled up by an immense deposition



of coagulable lymph, which was quite soft and recent; the mass also adhered to the parietes of the abdomen. There was a similar deposition, though in smaller quantity, on the surface of the great intestine, and was traced nearly to the extremity of the rectum; it also appeared on the surface of the liver. The omentum was inflamed and dark-coloured, and there were considerable marks of inflammation on the peritonæum lining the parietes of the abdomen.

CASE V.—A girl, aged 15. (12th May 181 .)—Had fever, with pneumonic symptoms; was bled with relief; the fever subsided gradually, and on the 19th she was considered as well. On the 20th, at night, she complained of some pain of the belly, which soon went off, and through the night she felt no uneasiness. (21st.)—Had violent pain, with vomiting; pulse frequent; pain increased by pressure. Took some laudanum, and afterwards purgative medicine. The vomiting subsided after the laudanum; the pain was much alleviated, and was only complained of on pressure. The purgative medicine did not operate during the day, but operated in the night four or five times. I saw her for the first time on the morning of the 22d, and found her moribund. Pulse not to be counted from its weakness; features collapsed; belly tympanitic. Died in less than an hour after the visit. *Dissection.*—The bowels in several places, especially on the ileum, were inflamed with effusion of coagulable lymph. At the lower end of the ileum, about an inch from the caput coli, there was an inflamed portion, in the centre of which there was a white spot the size of a shilling, and in the centre of this spot a round aperture, which admitted a small quill; the edges of it were rounded and a little thickened. Much fluid feces and gas had escaped into the cavity of the peritonæum, and the bowels were not distended. There were in some places a few livid spots, but no gangrene.

CASE VI.—A man, aged 50, had acute pain of the hypogastric region, with dysuria. After the operation of a dose of castor oil, on the following day the pain was so much increased, as to produce writhing of the body: urgent ineffectual efforts to pass urine; pulse natural. Relief was obtained from the warm bath, after which urine was voided. 3d day, Pain and dysuria continued; pulse nearly natural; bladder found empty by the catheter. (4th.) Copious evacuations by stool; some high-coloured urine passed; pulse 90 and soft; tongue white. (5th.) Pain returned after a saline purgative, which operated scantily; it was chiefly referred to the left iliac region; increased by pressure; restlessness; much flatus from the stomach; some vomiting on taking anything; pulse 96, in the evening 84. (6th.) The pain had shifted to the right iliac region; pulse 124, small and weak; features collapsed; body cold; died at 4 P.M. *Dissection.*—Much exudation and adhesion over the whole surface of the bowels. The ileum, cæcum, and colon, were injected with



numerous blood-vessels, in some places so as to acquire a dark colour, but the texture remained entire and firm. The appendiculæ pinquedinosæ were injected and covered with a viscid effusion, communicating the appearance of a mass of disease. The external and posterior portion of the bladder appeared also a little injected; other viscera natural.\*

CASE VII.—A woman, aged 45, (26th October 1816,) had frequent vomiting, and pain across the epigastrium, which was increased by pressure, by motion, and by a full inspiration; pulse 84; tongue white; bowels had been moved in the morning. Was bled to ℥xii. and took laxative medicine.

27th. Vomiting subsided; pain not relieved, but extended farther down over the abdomen; much increased by pressure; pulse 84. Was bled again, but only ℥vi. obtained; took castor oil.

*Vespere.*—Bowels moved fully five or six times; evacuations at first scybalous, afterwards thin and feculent. Severe pain, occurring in paroxysms; great tenderness over the whole abdomen; tongue white; pain excited by a full inspiration, and by motion; pulse 84, of good strength. Was bled to ℥xx.

28th. All the symptoms relieved; bowels open; was well in a few days.

CASE VIII.—A gentleman, aged 25, (18th September 1816,) was affected with pain in the bowels, and frequent desire to go to stool, with scanty slimy discharges; pulse natural; took castor oil, which produced several stools, thin, feculent, and pretty copious; pain of the belly continued, not constant, but occurring in paroxysms, and aggravated by motion; belly painful when pressed; pulse then 80; considerable dysuria. Was bled to ℥xvj. and took a moderate opiate.

19th. Easy in the night, but in the morning the pain returned with such violence as to occasion screaming and extreme distress; it was chiefly about the umbilicus, but sometimes shifted to the stomach; violent pain in the region of the bladder, and extending along the whole course of the urethra; much dysuria; some vomiting; belly very tender; pulse from 90 to 100; several feculent consistent stools after a mild enema. Was bled to ℥xvj.; took gr. x. of aloes. After the bleeding, the violent pain subsided; the tenderness continued; repeated vomiting; and occasional short paroxysms of pain; dysuria continued, and at one time amounted to retention, which was relieved by a mild enema; bowels open; took an opiate at night.

20th. Much depression; sickness and faintness; belly tender and a little tympanitic; lay on his back, but could not bear the pressure of the bed-clothes; dysuria abated; no constant pain, but occasional

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\* This important case is by Dr Marshall Hall. For the more particular details of it, see Vol. XII. of this Journal, p. 426.



paroxysms of short duration; respiration short and quick; countenance anxious; voice feeble; pulse 100; tongue foul; some vomiting; on taking a full breath, felt severely pained and cramped across the epigastrium. Was bled to  $\frac{3}{4}$  xii.; took some aloes, and at night gr. vi. of calomel.

Was much relieved after the bleeding; belly bore pressure; breathed more freely, and spoke more vigorously; pulse 100; tympanitic feel gone; discharged much flatus, and bowels were moved once.

21st. In the early part of the night was restless, with delirium and frequent vomiting. In the morning his bowels were moved four or five times, with much relief; pulse 80; all the symptoms abated. From this time continued well; discharged much hardened feces for several days.

In this important case, I believe the bleeding ought to have been repeated on the evening of the 19th, and the opiate seemed to be rather injurious.

### III.—Peritonitis passing into Enteritis.

CASE IX.—A gentleman, aged 20, (3d September 1812,) was affected with pain in the lower part of the belly, increased by pressure; bowels regular; pulse from 84 to 90; complaint began on the 2d; was bled freely, and took laxative medicine, which operated fully.

4th. Pain much relieved, but not gone; pulse 90; bleeding was repeated, and a blister applied.

5th. 6th. Pulse natural; complained only of occasional griping pain; took laxative medicines, which operated; the stools were green and watery, but copious.

7th. Free from complaint in the morning; bowels open; but the stools were still green and watery. In the afternoon complained that some laxative medicine produced most unusual pain; and at night had fixed pain in the upper part of the belly, with shivering, followed by heat; pulse 84. Through the night had copious feculent evacuations, without relief of the pain; vomited repeatedly.

8th. Pulse 96; fixed pain in the upper part of the belly; the whole abdomen was hard and painful on pressure, and a little tympanitic; repeated vomiting. From this period the bowels became obstructed, and the case resisted every active remedy; repeated blood-letting; blistering; cold applications; purgative injections; tobacco injections; various purgatives, &c.

9th. Pulse 100; pain unabated, but bore pressure better; belly tympanitic; vomiting abated; no stool, except some very scanty discharges of watery matter. At night, the pulse rose to 126; features contracted; belly swelled and tympanitic; hiccup; pain much abated. In the night the bowels were moved. Sunk gradually, and died at 9 o'clock on the morning of the 10th. *Dissection.*—All the intestines much distended, and glued together at every part by most extensive deposition of coagulable lymph; omentum highly inflamed,



and adhering to the intestines. At the lower end of the small intestine an extensive portion was gangrenous, and another at the lower part of the colon before it forms the sigmoid flexure. At this place the posterior part of the intestine, and a portion of the mesentery, were considerably thickened. The appendix vermiformis was gangrenous, and an opening had taken place in it, through which liquid feces had escaped into the cavity of the abdomen.

CASE X.—A gentleman, aged about 20, (10th December 1817, late at night,) was found writhing and screaming, from violent pain in the abdomen, every part of which was tender to the touch; great pain and difficulty in making water; frequent vomiting; pulse 96, soft and rather weak; had felt pain for several days, but it increased on the evening of the 9th, with vomiting; took laxative medicine in the morning of the 10th, which operated freely three or four times, but since these evacuations the pain was much increased. Was largely bled, and took a moderate opiate.

11th. Much relieved; no vomiting; pain much abated; pulse 90, and of good strength. Bleeding was repeated; a mild enema.

In the course of the day, had some violent paroxysms of pain, and vomited twice; belly bore pressure better, except at one spot at the lower part of the right side, where it was acutely tender; urine passed more easily; pulse at night, 96: bowels moved: evacuation thin and feculent. Bleeding was repeated at night; cold applications to the abdomen; blister; mild enema.

12th. Pulse 90; no stool; less pain, but much tenderness of abdomen; very little vomiting; no tumefaction of abdomen. Two small bleedings, no more being borne; large blister; various laxatives.

13th. Pulse increasing in frequency, and becoming feeble; abdomen enlarged at the lower part, as if the bladder were distended, but by the catheter it was found to be empty; abdomen still tender; no stool; urine very scanty, and passed with much pain. Tobacco injections and various purgatives were employed.

14th. Pulse 120; no stool; no urine; belly tympanitic; lay through the day in a state of great exhaustion, with much vomiting, and died at night.

*Dissection.*—Extensive inflammation of the ileum, the inflamed parts extensively glued together, and pressed down into the pelvis by the distention of the parts above, which were inflamed also, but with less exudation; no gangrene; bladder inflamed and collapsed; omentum inflamed; about 1 lb. of puriform fluid in the cavity of the peritonæum.

#### IV.—Enteritis.

CASE XI.—A young lady, aged 18, (4th March 1813,) complained of pain in the lower part of the belly, increased by pressure. Pulse 126. Some vomiting.



Was bled largely, and took laxative medicine ; soon after had one stool ; but, the pain and fever continuing, the bleeding was repeated at night, and the other usual remedies ordered.

5th. No relief ; no stool. Pulse 120. Various laxatives, cold applications, tobacco injections, &c. were used without benefit, except that the cold applications to the abdomen (iced water) produced great alleviation of the pain.

6th. No stool ; much pain ; great paleness and sinking. Pulse 120. Various purgatives and injections were persevered in.

7th. Began to discharge after the injections some green slimy matter. Pain as before ; pulse 120 ; countenance depressed and pale.

From this time the pain began to subside, and the pulse to come down gradually. On the 11th it fell to the natural standard. By persevering in the use of laxative medicines and injections at short intervals, the bowels began to yield, and on the 12th were fully moved four or five times.

From the commencement of her illness she had been affected with a pain in the left ear, and about the seventh began to complain of violent headach. This increased gradually ; and on the 22d she died of an affection of the brain, which I have formerly described, (Obs. on Chronic Inflamm. of Brain, case 11th.) From the 12th to the 22d, the bowels continued to discharge their functions in the healthy manner. *Dissection.*—The caput coli, and about eighteen inches of the lower end of the ileum, were of a dark livid colour, but not altered in their structure. Intestines in other respects were healthy.

CASE XII.—A child aged 3 years and 3 months. (12th February 1812.)—Was affected with urgent vomiting and great thirst, all the liquid taken in being vomited almost immediately, mixed with large quantities of light green fluid. Pulse very frequent. Countenance sunk and anxious. Complained of no pain. She had been unwell for four or five days, but slightly. Took laxative medicine on the 9th, which operated freely. On the 10th seemed much better, and the bowels were quite open. Complained once of pain in her bowels, but had not mentioned it again. Vomiting began late on the evening of the 10th, and was very urgent through the whole of the 11th. Bowels had not been moved since the vomiting began.

The usual remedies were employed without benefit. The vomiting continued urgent, and the bowels obstinately obstructed. 13th.—Vomiting abated ; medicines retained, but no effect from them. She continued through the day at times restless and feverish, at others oppressed and exhausted. Died in the night.

*Dissection.*—Stomach externally healthy ; internally slightly inflamed, and containing much dark-coloured fluid. About a fourth part of the small intestine, at the upper part, was lightly inflamed ; in many places black and gangrenous ; in others, adhering from effusion of coagulable lymph. The diseased portion was greatly distend-



ed, and contained much dark-coloured fluid, but no feces. Immediately below this part the intestine became at once completely contracted, empty, and of a white colour, except a few streaks of superficial redness.

#### V.—Inflammation of the Villous Coat passing into Enteritis.

CASE XIII.—A woman, aged 38, had been for more than a week affected with fever, want of appetite, and frequent diarrhœa, with much pain, when, on 13th June 1819, she was suddenly seized with most violent pain of the abdomen, especially about the lower part; but it afterwards extended over the whole abdomen. On the 20th the pain continued most violent, and was increased by pressure and by inspiration. Pulse 130; urgent vomiting. An attempt was made to bleed her, but very little was obtained, and soon after the pulse sunk, with coldness of the body; some discharge from the bowels. (21st.)—I saw her for the first time. Pain still severe; urgent vomiting, and hiccup; bowels obstructed; pulse 140. Died in the afternoon. *Dissection.*—Extensive inflammation on the outer surface of the small intestine, especially at the lower part, where there was considerable exudation and gangrene. Extensive inflammation of the inner surface in various places; and the inflamed portions were covered with minute ulcers or erosions. At one place, at the lower part of the ileum, there was a more extensive destruction of the villous coat, about the size of a shilling; this portion was surrounded by a ring of inflammation, with numerous small ulcers, and in the centre of it there was a small opening which perforated the intestine; the outer surface at this place was of a dark livid colour.

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The high importance of the subject must be my apology for detailing so many examples, calculated, I trust, to illustrate the pathology of this most insidious and dangerous disease. They seem to warrant various pathological conjectures and important practical conclusions, both of which I must propose very briefly.

#### I.—*Pathological Conjectures.*

(1.) It is probable that intestinal inflammation may be primarily seated either in the peritonæal, the muscular, or the villous coat,—that it may be for a considerable time confined to one of them; and may afterwards pass from one to another, or may affect all the three.

(2.) It is probable that the terminations of inflammation are, in the peritonæal coat gelatinous exudation and serous effusion;



in the villous, erosion or ulceration, sometimes with exudation ; in the muscular, gangrene.

(3.) It is probable that, when the inflammation is confined to the villous coat, the action of the canal is increased,—when to the peritonæal coat, that it may be increased, or may be natural,—that, when it affects the muscular coat, the action is impeded so as to produce obstruction or ileus.

## II.—*Practical Conclusions.*

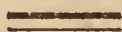
(1.) Extensive and highly dangerous inflammation may exist in the intestinal canal without obstruction,—may exist and go on to a fatal termination while the bowels are spontaneously loose, or are easily moved by mild medicines.

(2.) No diagnosis can be founded in such cases on the appearance of the evacuations ; they are sometimes slimy and in small quantity ; sometimes copious, watery, and dark-coloured ; and sometimes quite natural.

(3.) Extensive and highly dangerous inflammation may be going on with every variety in the pulse. It may be frequent and small, it may be frequent and full, or it may be little above the natural standard through the whole course of the disease.

(4.) Extensive inflammation may go on without vomiting and without constant pain, the pain often occurring in paroxysms and leaving long intervals of ease.

(5.) The peculiar tenderness which marks inflammation is the principal guide of the practical physician. Whenever this occurs, whatever may be the state of the pulse, and whatever the condition of the bowels, a disease is going on which will require his most eager attention, and his most active remedies.



## OUTLINE OF THE TREATMENT OF INTESTINAL INFLAMMATION.

IN the treatment of this affection it is of essential importance that our attention be steadily and precisely directed to the real disease with which we are contending, and be not distracted by circumstances which may be considered as occasional effects of it. The disease is inflammation ; and to subdue that is our great, our leading object in the treatment. An effect or concomitant by which our attention is apt to be distracted in many cases, is obstruction of the bowels. Now, this obstruction is not the disease,—it is only an effect of it, and an effect which, even



in the severest cases, is often wanting. This we have seen in various examples. We have seen the bowels obstructed,—we have seen them natural,—and we have seen them spontaneously loose; and under these various circumstances we have found the disease going on with equal certainty, and equal rapidity, to a fatal termination. We have seen no reason to suppose that the retention of feculent matter was injurious in the one case, or that the copious evacuation of it was productive of the slightest benefit in the other. On the contrary, there are facts which must lead to a suspicion that the action of purgative medicine upon the intestinal canal, when it is in a state of inflammation, rather tends to increase than diminish the disease. I do not assert that this principle is applicable to every case without discrimination. There may be examples in which acrid and irritating contents are acting injuriously, and there may be cases which supervene upon ileus, to which perhaps other principles must be applied. But I think it must be admitted that, in the ordinary cases of enteritis, the obstruction of the bowels is the immediate result of the inflammation;—that it is to be removed by subduing the inflammation, and by this only,—and that, could it be removed by any other means, it would in no respect improve the situation of the patient, as the original and highly dangerous disease would remain unchanged. On this important and delicate point I would not speak with unbecoming confidence; but I do submit, whether the whole phenomena of abdominal inflammation do not lead to the impression, that the use of purgatives is no part of the treatment in the active stage of the disease, and whether they are not likely to be injurious rather than beneficial. Even in the cases in which there is no obstruction, but in which mild purgatives operate readily, the patient generally complains of aggravation of the symptoms after their operation. How much more likely is this to occur in cases of proper enteritis, in which active purgatives are often given in repeated doses without avail? If benefit in these cases be expected from evacuation of the bowels, that benefit is not obtained, while there can be little doubt that an additional cause of irritation is thrown into the diseased parts; and why is this object thus defeated? because there exists in the intestine itself a disease which prevents its action, and which prevents purgatives from producing their usual effects. It would no doubt be desirable, in many of these cases, that the canal were freed from the presence of feces; but the question is, whether the injury from their presence can be compared with that which must arise from violent and ineffectual efforts to expel them,—from violent and ineffectual excitement of parts which



are already in a state of active inflammation. I have formerly referred to a fact which is also of essential importance in this inquiry ; that, when purgatives do operate in cases of this kind, they generally bring off nothing but watery matters ; and that it is only after the disease is subdued, and the bowels have recovered their healthy action, that solid feces are thrown off, which, we have every reason to believe, had been lodging from the commencement of the disease. There are, then, two views of this important subject which I submit for investigation and inquiry. (1.) That in the cases which I have considered as peritonitis, in which purgatives operate fully, we have no reason to consider their operation as beneficial during the active stage of the disease. (2.) That in the cases of proper enteritis their operation is defeated by the very disease with which we are contending.

In the treatment of enteritis, indeed, it is of essential importance that the intestines should be kept free from distention ; but it is a point deserving most attentive inquiry whether this may not in general be done by means which are both safer and more effectual than the use of purgatives ; particularly whether there be not, in the ordinary cases of enteritis, an action in the healthy part of the canal itself, which would answer every purpose that can be desired, did there not exist some great obstacle to its action, and whether our object ought not to be to remove this obstacle rather than to increase the action itself. The obstacle arises from the deranged action of the inflamed parts, and the chief means by which it is to be removed are those by which we subdue the inflammation ; but there is a powerful auxiliary, which I think is calculated to answer the purpose for which purgatives are given, and that is the tobacco injection. I have formerly alluded to the precautions with which this very powerful remedy ought to be administered ; the great advantage attending the use of it in enteritis is, that, while it tends to move the bowels and keep them free from distention, it is, at the same time, powerfully calculated to allay vascular action, and may thus assist in keeping down the inflammation.

These principles I submit for farther investigation. Several facts which I have related certainly give considerable reason to believe, that, when the intestinal canal is in a state of active inflammation, the tendency of purgatives is rather to increase than diminish the disease ; and I think I am warranted in proposing this rule,—that they are not to be considered as a part of the treatment of enteritis, but rather to be avoided, if it be possible ; that is to say, except there exist some strong and decided reason for having recourse to them. What the cases are



in which such reasons exist must be left to the judgment of the practitioner; perhaps in those which have supervened upon long continued costiveness or ileus, and when there is such a distention of the bowels with flatus or other matters, as must be highly injurious. In such cases, if we fail in obtaining the desired effect from the tobacco injection, or mild laxative injections, mild purgatives may be necessary, after the first activity of the inflammation has been subdued. But in how many instances are these causes wanting?—Do we not often see enteritis supervene upon the powerful operation of a drastic purgative, especially on exposure to cold after such operation? And in how many cases do purgative medicines which have been taken on the first appearance of the symptoms operate fully? To push the use of purgatives in such cases would be manifestly unnecessary, and probably injurious. The disease which we have, then, to contend with, is simply inflammation, and it must be combated in the most active manner by the appropriate remedies. These are few and simple; the most important is bloodletting repeated according to the urgency of the symptoms and the strength of the patient. Of local remedies, large topical bleeding and blistering are often extremely beneficial. In a considerable number of cases I have used with evident advantage the application of cold, by covering the abdomen with cloths wet in cold water or iced water, or by pounded ice in a large bladder. Of iced water given by injection I have had little experience, but I believe it to be a remedy deserving of attention. The inflammation being subdued, the bowels are then to be moved by gentle laxatives, aided by mild injections. This, however, is often a matter of considerable difficulty, arising, I imagine, from a weakened or paralysed state of the muscular fibres, which has been produced by the inflammation. I cannot say with confidence what is the best mode of treatment, but I think that mild medicines, in moderate doses, repeated at short intervals, and steadily persevered in, succeed better than the more powerful. Perhaps long-continued friction of the abdomen may be useful, and warm-bath. Our object should be to produce natural and healthy evacuation, and nothing more. Strong purging may be followed by a tympanitic state of the abdomen, not to be recovered from.

In all cases of active inflammation, bloodletting can be of little avail except it be used at an early period, and pushed to such an extent as to make a decided impression upon the system, indicated by weakness of the pulse, paleness, and some degree of faintness. During this state of collapse, an impression is made upon the disease, which, however, is often lost, as soon



as the circulation has recovered its former vigour. On this account, in every inflammation of a vital organ, it is, I think, of essential importance, that the first bleeding be carried to such an extent as to make a most decided impression, and that attention be paid to prevent this advantage from being lost, by repeating it after a short interval, whenever the effect of the former begins to subside. In various inflammatory diseases I have used with manifest advantage the following method. The treatment is begun with a full bleeding, which produces weakness of the pulse and a considerable degree of faintness; the latter soon subsides, but the pulse continues weak for a longer time. Whenever it begins to recover from this weakness, a small bleeding is repeated, so as again to break the force of it, and for this purpose, perhaps, no more may be required than five or six ounces. Such a bleeding is again repeated at another very short interval, and so on till we have reason to believe that the disease is subdued. The advantage of this method is twofold. (1.) By thus keeping up the effect of the first bleeding, the disease is likely to be checked at a very early period; and, (2.) The quantity of blood that is lost, is in the end much smaller than may often be required under other circumstances. For if, instead of this, we allow the patient to lie after the first bleeding ten or twelve hours, or even a shorter period, the effect of it is often entirely lost, and it is then necessary to repeat it to the same extent as before. Twenty ounces of blood may be required upon this method for producing that effect upon the system, and, consequently, on the disease, which, on the other, may be procured from five; and, besides this, in the interval the disease has been gaining ground, its duration is protracted, and the result consequently rendered more uncertain. The inflammation of a vital organ should not be lost sight of above an hour or two at a time, until the force of it be decidedly broken; and except this take place within the first twenty-four hours, the termination of it must be considered as doubtful.\* On this important subject I shall only add the following beautiful illustration of the effect of bloodletting in inflammatory diseases. A man, aged 24, after being for several days affected with acute rheumatism, was seized with a strong pulsation in the region of the heart, which, after two days, was accom-

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\* In a violent inflammatory case, in which it is probable that repeated bleeding may be necessary, great benefit is obtained from the very simple expedient of inserting a little ointment between the lips of the orifice after the first bleeding. Adhesion is thus prevented, and blood may be taken from the same orifice many times.



panied by acute pain in the same situation, and anxious oppressed breathing. These symptoms had continued one day when I first saw him; the pain was violent, and impeded respiration; the breathing was so much oppressed as to prevent him from lying down, and the pulsation of the heart was so violent that it could be felt by the hand over every part of the thorax, and even on the upper part of the abdomen. The pulse was 106, and intermitted about twelve times in a minute. Several of his joints were still affected; his feet and ankles particularly were swelled and intensely painful, incapable of bearing the slightest touch or motion, and in a state of high vivid inflammation, resembling erysipelas. He was bled to above thirty ounces, which he bore without faintness. Two hours after I found the symptoms somewhat relieved, but by no means removed, and the inflammation of his feet as before; the pulse 112, and strong. He was then bled to eighteen ounces. When that quantity was taken he became extremely faint, and the pulse exceedingly weak; and he lay in that state of faintness for upwards of half an hour. During this time every symptom in the thorax was removed, and the inflammation of his feet completely disappeared; they became of a pale and natural colour, and could be pressed or moved in any way without uneasiness. On the following day he continued well. After another day or two the rheumatic affection returned to his ankles, but in a slight degree, and without fever, and it soon yielded to the usual remedies. The value of this case depends on the beautiful illustration, furnished by the disease on the ankles, of what was probably going on within, and of what probably takes place in every internal inflammation when the remedies are employed in a decided manner.

Before I conclude these very general remarks, I would briefly allude to some circumstances which often occur during the treatment of enteritis, and which are apt to embarrass the young practitioner.

1. The pulse continuing very frequent after the local symptoms appear to be considerably subdued by repeated bleeding. While this continues there is always danger of the inflammation being renewed. In this state digitalis is given very freely with much advantage.

2. A tympanitic state of the abdomen. If this occur before the inflammation is subdued, the prognosis is extremely unfavourable. But it may occur after the disease is checked, from a temporary derangement of the muscular action. It, however, requires most minute attention. Gentle friction may be employed, and the pressure of a roller. Mild injections are useful,



to which a little assafoetida may be added ; but I think I have seen the greatest advantage in this condition from injections containing bark in powder in large quantities. Mild laxatives may be given, but medicines that would act strongly are to be avoided. These excite for the time, but when their action is over the parts are only still farther exhausted, become again distended, and may pass into gangrene. The disease is a loss of muscular action which is left by the inflammation, and it requires the most delicate management. It has frequently an alarming appearance, and may leave for a considerable time a deranged action of the parts, which often assumes the characters of organic or mesenteric disease. A boy, aged six, had acute pain in the abdomen, much increased by pressure and by inspiration ; short, anxious breathing ; pulse extremely frequent. He was bled from the arm, and took some laxative medicine which operated, and he was very much relieved. He then did well for two days, when, on visiting him at night, I found him oppressed and restless ; countenance anxious ; pulse above 140 ; the belly enlarged and tympanitic, and painful on pressure. Injections, containing bark in powder, and some tincture of assafoetida, were given every three hours with great relief, with friction, &c. Under this treatment the affection soon subsided, and in a few days he was able to be out of bed, but he continued feeble and sallow, with some cough, bad appetite, frequent pulse, and a withered emaciated appearance. Being sent to the country he recovered gradually, and is now in perfect health, but he continued in the state which I have mentioned for several months. I am persuaded that many cases, especially in children, which assume the appearance of mesenteric disease, depend upon a morbid condition of the muscular action of the canal, which impedes the process of digestion and assimilation. It is treated by good air and exercise, tepid bath, friction of the abdomen, with gentle compression, and vegetable bitters, as the colombo powder, combined with small doses of rhubarb or aloes.

3. A state different from the former, in which the abdomen is somewhat enlarged but hard, almost resembling, in some cases, a mass of organic disease. This is a formidable symptom, but if it occur after the inflammation is subdued it may be recovered from. The nature of it is obscure. It is certainly connected with some degree of intestinal distention, but it is not tympanitic ; it is hard and tense, sometimes painful on pressure, and has an alarming appearance. A young man, aged 17, whom I attended in a severe attack of enteritis, was free from complaint about the 7th day from the attack. On the 9th his pulse began to rise again ; and his belly, especially about



the lower part, became enlarged, very hard, and painful on pressure; the bowels open; his pulse, when sitting up, 120. In this state, in spite of every remonstrance, his friends carried him to the country. I expected to hear of his death, but the affection gradually went off, and he returned to town, in a few weeks, in perfect health.

4. Cessation of the pain, sinking of the vital powers, great weakness of the pulse, and coldness of the body. These are generally considered as indicating gangrene, and, consequently, a hopeless state of the disease. I have in the former paper on ileus produced evidence of the most important principle, that these symptoms do not necessarily indicate gangrene. I have shewn them connected with inflammation which was slight and recent, and I have shewn them recovered from. I shall now only add the following example. A man, aged 40, was affected with enteritis in the usual form, for which he was treated in the most judicious manner by a respectable practitioner. On the 5th day the pain ceased; the pulse was 140, and extremely feeble and irregular. His face was pale, and the features contracted, and his whole body was covered with a cold perspiration; his bowels had been moved. In this condition I saw him for the first time. Wine was given him to the extent of from two to three bottles during the first twenty-four hours. On the following day his appearance was improved, his pulse 120, and regular; the wine was continued in diminished quantity. On the third day the pulse was 112, and in a few days more he was well.

In a case such as this there could be no doubt as to the only mode of practice that could be attempted, but there are cases in which, at a particular period of the disease, wine is given with much advantage, though the symptoms are much more ambiguous; and it is often extremely difficult to decide upon the plan which ought to be adopted. A lady, aged about 35, on the 7th day after delivery, was seized with violent pain over the whole abdomen, most severe across the stomach and towards the right side; much tenderness on pressure; urgent vomiting; great restlessness; respiration short and oppressed; pulse 140, and sharp. The pain was aggravated by inspiration, and by every motion of the body. She was bled and blistered, and took laxative medicine, which operated freely. After the bleeding she was very much relieved; could breathe without uneasiness; the vomiting subsided, and the pulse was much diminished in frequency. This was in the night. On the following day the pulse rose to 150; the breathing was quick, short, and oppressed; some vomiting; countenance anxious; there

was neither pain nor tenderness of the abdomen, which was to the feel soft and natural; lochia natural. Wine was given in the quantity of a small glass every hour; and injections of beef-tea, each containing  $\frac{3}{4}$ ss. of bark in powder, and 60 drops of laudanum. These were repeated as often as they were discharged, which was generally from one to two hours. After some hours the symptoms were improved. Next day the pulse was from 125 to 130; on the third day from 112 to 120. Thus she gradually recovered, having continued to take a bottle of wine in each twenty-four hours. For some time she suffered severely from an aphthous state of the mouth and throat; accompanied by burning uneasiness at the stomach, and pain in the bowels. These complaints yielded to a decoction of logwood.



*With the author's Comments*

# RESEARCHES

ON THE

PATHOLOGY OF THE INTESTINAL CANAL.

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## PART III.

ON THE DISEASES OF THE MUCOUS MEMBRANE.

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# RESEARCHES

ON THE

## PATHOLOGY OF THE INTESTINAL CANAL.

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### PART III.

ON THE DISEASES OF THE MUCOUS MEMBRANE.

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**T**HE internal coat of the intestinal canal is to be viewed in the double light of a mucous membrane and an absorbing surface. It is in the former view that it is chiefly to be regarded as the seat of active disease; but it is evident, that such disease must influence in a great degree its function of absorption, and that this must have an important relation to the effects which will be produced on the system. The morbid conditions of it, which chiefly deserve our attention, are referable to inflammation, acute or chronic, and the various effects or terminations of inflammation, as thickening, erosion, and ulceration.

SECT. I.—*Symptoms of active Inflammation of the Mucous Membrane.*

As the disease at its commencement frequently excites little attention, the first symptoms are not well ascertained. When it comes under our view as an object of practice, we generally find more or less diarrhœa, with pain in the abdomen, which is sometimes extensively diffused over it, and sometimes confined to a particular part. It is usually increased by pressure, when the pressure is rather firm, but without that acute sensibility to a slight touch which attends inflammation of the peritonæum; it differs from peritonæal inflammation also, in being less affected by inspiration and by motion, so that the patient can often bear the erect posture with little inconvenience. The pain, in general, varies very much in degree, leaving long intervals of ease, and then occurring in paroxysms of violent tormina; these are generally followed by discharge from the bowels, but may take place without any discharge following them. In some cases, however, the pain is more permanent, so as more nearly to resemble the pain of enteritis. In general, there is frequency of pulse, with thirst, febrile oppression, and a brownish fur on the tongue; but, in some cases, the pulse is little above the natural standard through the whole course of the disease. There is frequently vomiting, but not urgent, and sometimes a peculiar irritability of the stomach, so that any thing taken into it excites a burning uneasiness, and this is usually followed by an irritation of the bowels, with a feeling as if the article which was swallowed almost immediately passed through them.

The evacuations from the bowels vary very much both in appearance and frequency. In some cases they are slimy, and in small quantity; in others, they are copious; sometimes they are watery and dark coloured; sometimes whitish; frequently yellow and feculent, as in a common diarrhœa; and sometimes articles of food or drink pass through nearly unchanged. They are in some cases extremely frequent, the patient being called to stool every ten or fifteen minutes; in others, the disease may be going on rapidly to a fatal termination, while the bowels are not moved above three or four times in the day. No diagnosis of the disease, therefore, can be founded either on the frequency of the evacuations, or on the appearance of the matters evacuated. In some cases there is tension of the abdomen, but in others this is wanting; and it may appear and disappear several times in the course of the same case.



With these varieties in the symptoms, the disease may go on for some time before its real nature is suspected; it may be considered as a common diarrhœa, and thus excite little attention and no alarm. In the farther progress of it there are considerable varieties. It may be fatal in one or two weeks, or it may extend to five or six, or it may pass into a chronic state, forming a disease analogous to that which has been called Lientery, and in this form may be drawn out to many months, and be at last fatal by very gradual exhaustion. Its fatal terminations in the active state are two, (1.) A peculiar rapid exhaustion, such as is not accounted for by the frequency of the evacuations, which often bear no kind of proportion to the constitutional effects that take place. (2.) By passing into peritonæal inflammation or enteritis. In this case the diarrhœa usually ceases a few days before death. The pain increases, with acute tenderness of the abdomen, often with vomiting and all the usual appearances of enteritis.

The diagnosis is often difficult. The disease should be suspected when there is diarrhœa with much pain, and the pain increased by pressure. If these symptoms are accompanied by fever, the case is still more suspicious, but fever, as I have already stated, is frequently wanting. The disease occurs both in an idiopathic form and as a symptomatic affection. In the latter case, it appears as an attendant on continued fever, and may either exist from the commencement of the fever, or may begin at an advanced period of it. It seems occasionally to accompany or follow other febrile diseases, especially measles, and there is reason to believe that it may supervene upon affections of the bowels, which, at first, were free from any dangerous character,—a case beginning like a simple diarrhœa, and after it had gone on for eight or ten days, the symptoms appearing which indicate this affection. In a less active form it follows many diseases of a scrofulous nature, forming a colliquative diarrhœa. The causes of the idiopathic cases are not well ascertained. It is sometimes ascribed to cold; in women especially to exposure to cold during the flow of the menses. It is probable, also, that it may be induced by acrid ingesta of various kinds, drastic purgatives in over doses, and by the mineral poisons.

The appearances, on dissection, vary considerably, according to the period of the disease at which the fatal event takes place. When this happens at an early period, we find the mucous membrane covered with irregular patches of inflammation, which are, in general, sensibly elevated above the level of the sound parts. They vary exceedingly in extent in different cases, in some ex-



tending over a great part of the canal ; in others, being confined to a very small portion of it, frequently about the lower end of the ileum, or the head of the colon. They vary also in size, consisting, most commonly, of patches one or two inches in diameter, with sound portions interposed betwixt them, above which they are sensibly elevated. In other cases, but I think less frequently, a considerable extent of the canal is of a continued uniform redness.

The inflamed portions are in some cases covered by a brownish tenacious mucus ; in others, by coagulable lymph, and frequently the surface of them is studded with minute vesicles, which, at a more advanced period, seem to pass into very small ulcers. In other cases small round portions of the membrane are observed of a grey colour and soft pultaceous appearance, are found to be easily separated, and to leave ulcers. In the cases which have gone on to a more advanced period, we find ulcers of various extent and appearance. In some examples, they are of the same colour with the surrounding parts, and merely appear as if a portion of the membrane had been dissected out. In other cases they are more decidedly ulcers, covered at the bottom with yellowish sloughs, often with elevated edges, and surrounded by a ring of inflammation, and sometimes penetrating to such a depth as completely to perforate the intestine. These different appearances seem to be different stages of the same disease ; for we may sometimes observe one of these penetrating ulcers, surrounded by a larger circle of abrasion, without evident ulceration, and this by another ring of inflammation ; this outer inflamed portion being probably covered by the very minute ulcers or small vesicles formerly mentioned. The appearances which I have now described seem to be the most common ; but cases occur in which an extensive portion of the mucous membrane is black and gangrenous, and sometimes an extensive portion has been found to be separated, so as to expose the muscular coat, or even the peritonæal. Cases are also described which have recovered, after a portion of the internal coat had been thrown off in this manner, in one continued cylinder of great extent. The external surface of the intestine is sometimes healthy ; in other cases there are spots of obscure redness corresponding to the inflamed portions of the mucous membrane. The cases which terminate by peritonæal inflammation or enteritis, have the appearances usual in these affections, and in the cases in which the ulcers penetrate the intestine, effusion of coagulable lymph, lividity, or gangrene, to a small extent, may often be observed on the outer surface, surrounding the perforations.



SECT. II.—*Of the Disease in Infants.*

Acute inflammation of the mucous membrane appears to be a frequent disease of infants about the age of six or eight months, and it forms a most interesting subject of research. The most important point in the investigation relates to the means of distinguishing the disease, in its early stages, from the ordinary bowel complaints of children about the period of dentition, and this is, in general, a matter of considerable difficulty. The principal point to be kept in view in the diagnosis is, that it is a febrile disease; the infant is usually hot and restless in the early stages, with thirst, and the tongue is dry, or covered with a brownish crust; there is, in general, a good deal of screaming and fretfulness; bad sleep; frequently vomiting; and, in many cases, pressure on the abdomen seems to give uneasiness. In many instances the disease assumes very much the appearance of the affection which has been called the remittent fever of infants, a term which I suspect has been applied to various febrile affections, which are merely symptomatic. The bowels are loose; but, as I have already observed, in regard to the disease in adults, the looseness of the bowels is by no means a prominent symptom in every case; for, even in the advanced stages, the bowels may not be moved above three or four times in 24 hours, while the disease is advancing rapidly to a fatal termination. In other cases this symptom is more urgent; the evacuations are preceded by much restlessness and appearance of pain, and the matters evacuated are sometimes discharged with a singular force, so as to be propelled to some distance. The evacuations vary much in appearance, and I have not been able to satisfy myself that any reliance is to be placed on them in ascertaining the disease. They sometimes consist of a reddish-brown mucus, sometimes of a pale clay-coloured matter, and sometimes of a dark watery fluid; but, in many cases, they shew little deviation from the healthy state, while in many, their appearance is evidently disguised and modified by articles of food or drink, which pass through nearly unchanged. The disease, in fact, often goes on for some time without exciting alarm, or being distinguished from an ordinary diarrhœa, until attention is strongly and suddenly directed to the dangerous nature of it, by the occurrence of constitutional symptoms, which do not appear in the ordinary bowel complaints of children. These consist, in some cases, of a great degree of febrile oppression, with dry crusted tongue, thirst, and vomiting; in others of a very sudden and rapid exhaustion of the vital powers, which is unex-



pected, and is not accounted for by the frequency of the evacuations, and sometimes of the sudden appearance of coma, with a peculiar hollow languid state of the eye, and a pale waxen look of the whole body, while the pulse, perhaps, is of tolerable strength. These symptoms may appear while the disease has been going on for a short time, and the evacuations have been by no means frequent; while the disease, in a word, was not to be compared, either in its continuance or the frequency of the evacuations, with the ordinary bowel complaints of children, which often go on for a long time without producing any inconvenience.

The causes of the disease are not well ascertained. It frequently occurs about the period of dentition, and in many cases appears to be connected with weaning. The fatal terminations are either by a rapid and peculiar sinking of the vital powers, or by coma. On dissection we usually find the affection in what may be considered as the first stage. In various parts of the inner surface of the intestine, particularly the ileum, there are irregular patches of inflammation, slightly elevated above the level of the surrounding parts, and often covered with the minute vesicles, or minute ulcers, formerly mentioned. I have not seen it, as in adults, pass either into more extensive ulceration, or into peritonæal inflammation. Effusion in the brain is met with in the cases which terminate by coma. This termination is often preceded by a remarkable scarcity of urine, amounting, in some cases, nearly to a suspension of the secretion; but I have not ascertained whether this symptom be confined to the cases which terminate by coma.

### SECT. III.—*Of the Chronic Form of the Disease.*

The disease, in its chronic form, may supervene upon the acute, or it may come on gradually without any acute symptoms. After it has continued for some time, we generally find the patient considerably emaciated, often with a peculiar withered look. There is an untractable diarrhœa, which, in some cases, is permanent; in others, occurs at short intervals, continuing for a few days at a time, and alternating with costiveness. In some cases the appetite is good, or even voracious; but, in general, it is variable and capricious, with indigestion and great uneasiness after eating, and sometimes every thing that is taken into the stomach produces a peculiar uneasiness, which passes downwards into the bowels, and is only relieved after repeated evacuations. If by opiates or astringents the diarrhœa be re-



strained, the uneasiness in the stomach is generally much increased, and in some cases vomiting is excited. In other cases, vomiting regularly alternates with the diarrhœa, the patient being for a few days at a time affected with frequent vomiting without diarrhœa, and then for a few days with diarrhœa without vomiting. Remedies given in such cases to alleviate the one lead to the other, or they may alternate without any interference. There is generally pain in the abdomen, but it varies much both in degree and duration; in some cases it only appears in the form of tormina preceding the evacuations; in others it is more permanent, and is increased by pressure.

The matters evacuated vary much in appearance, being sometimes fluid and feculent, frequently white, and sometimes composed of a mixture of half-digested articles, with the addition of recent bile, or a brownish mucus, which appears to be the production of the diseased surface. In some cases there are discharges of venous blood, which may either appear in the form of coagula, or as a dark pitchy matter, giving a dark colour to the whole of the matter discharged.

Some of the chronic cases appear to go on for a considerable time without much disturbance of the general health; but, in others, there is much weakness and emaciation; frequently hectic paroxysms; and sometimes a rawness or tenderness of the mouth and fauces, with aphthæ or minute ulcers, often accompanied by a tenderness of the œsophagus, and a painful burning sensation in the stomach after eating.

The appearances on dissection shew the disease in various stages. In some cases, even after the symptoms have existed for a considerable time, we still find it in the form of irregular patches of a fungous appearance, and a dark red colour, slightly elevated above the healthy parts. In others, we find distinct small ulcers, with round elevated edges, and sometimes more extensive irregular ulceration, with ragged edges. Frequently the coats of the intestine are thickened at the ulcerated parts, sometimes to such a degree as considerably to diminish the area of the intestine. In such cases, the ordinary symptoms of the disease are apt to alternate with attacks of obstinate costiveness, and they are frequently fatal by ileus. In some cases, instead of ulceration, the inner surface of the diseased parts is studded with numerous tubercles, of various sizes, and sometimes an extensive tract of intestine is found covered with smooth cicatrices of ulcers, which have healed. In some of these cases, the symptoms have continued, and gone on to their fatal termination in the usual manner. In others, this appearance is found after the symptoms have ceased, and the patient has died of



some other disease. Cases have also occurred in which the patients died of emaciation, after the symptoms had ceased, apparently from these cicatrices being so extensive as to interfere with the process of absorption.

#### SECT. IV.—*Examples of the principal Forms and Terminations of the Disease.*

##### § I.—*The active Form of the Disease.*

CASE I.—Many years ago, a woman, aged 25, was admitted into the Infirmary of Edinburgh, affected with pain over the abdomen, tenesmus, and diarrhœa. The pain occasionally intermitted, and was most severe upon going to stool, and on passing urine. The evacuations were free from scybalæ or blood. She had thirst, headach, some cough, nausea, and occasional vomiting, a pale emaciated look, pulse 72. Ascribed her complaints to cold; and they had been gradually increasing for three weeks. Various remedies were employed, without benefit, consisting chiefly of opiates, absorbents, and calomel. The disease went on for eight days more, with various remissions and aggravations.

2d day.—Two stools; severe tormina, which were relieved by fomentation.

3d day.—Nearly free from tormina; one stool, which seemed to consist of broth which she had recently taken, little changed.

4th day.—Two scanty evacuations, without griping; abdomen hard and painful; vomited once; a mild enema produced a copious discharge, and relieved the tormina.

5th day.—Less pain; vomited several times; one stool, thin and feculent; pulse 78; took gr. vi. of calomel.

6th day.—Two stools; one of them thin and feculent; the other much tinged with blood; much pain before the evacuations; abdomen tense and painful; pulse 80; vomited a considerable quantity of slimy matter, tinged with blood, and having some pus mixed with it. Took gr. viii. of calomel.

7th day.—Two stools; thin, feculent, and of a natural appearance; preceded by much pain; vomited repeatedly some greenish slimy matter, mixed with bloody pus; less tension of the abdomen; pulse from 60 to 70. Took calomel with opium.

8th day.—No stool; and no vomiting. Died in the night.

*Dissection.*—The vessels on the stomach, duodenum, and jejunum, were unusually distended with blood. The ileum was livid, with some adhesions. Its internal surface was quite black; and it contained dark-coloured slimy matter, mixed with very fetid pus. The colon on the left side was livid, with adhesion to the abdominal pa-



rieties, and to the lower part of the omentum, which also was livid. Between these parts there was much fetid pus.

CASE II.—A girl, aged 6, was affected with severe and obstinate diarrhœa, which reduced her to great weakness and emaciation. It continued from three to four weeks, and then subsided, and was succeeded, after a short interval, by severe pain in the belly, headach, and vomiting; the bowels being then rather bound; the pulse was from 30 to 40 in a minute; the urine was high-coloured, and much diminished in quantity. The headach continued with vomiting, and a constant spasmodic motion of the right arm and leg; and, after seven days, she sunk into coma, and died in two days. The pulse continued from 30 to 40 till a day or two before death, when it rose to 70 or 80. I did not see this case during the life of the patient, who was treated in the most judicious manner by an intelligent practitioner. I was present at the examination of the body. *Dissection.*—There was considerable effusion in the ventricles of the brain; and a lacerated opening in the septum lucidum, surrounded by a ring of inflammation. The inner surface of the ventricles was remarkably vascular, and in some places very soft and broken down. In the anterior part of the left hemisphere, a portion of the brain was darker in the colour, and firmer than natural, and contained some hard tubercles. The inner surface of the caput coli, and of a great part of the ascending colon, was of a dark red colour, and covered with numerous patches of a dark red fungus, which were considerably elevated above the level of the surrounding parts. The other viscera were healthy.

CASE III.—A girl, aged 9, was seen by Dr Alison in December 1819, affected with the usual symptoms of contagious fever, which was prevalent in a narrow and crowded lane where she resided, and had affected a person in an adjoining room. From the commencement of the disease, she had diarrhœa, with griping, and considerable tenderness of the abdomen, and the evacuations were thin, feculent, and of a natural appearance. These symptoms continued, with frequent pulse, and foul dry tongue, till two days before her death, when the diarrhœa suddenly subsided, and was succeeded by violent pain, acute tenderness of the abdomen, and every symptom of peritonæal inflammation. The duration of the case was about three weeks. I did not see it during the life of the patient, but am indebted to Dr Alison for the above outline of it, and for an opportunity of being present at the examination of the body. *Dissection.*—There was considerable peritonæal inflammation, especially on the ileum, where there was extensive adhesion, with considerable deposition of coagulable lymph in flocculi. The adhering parts were also in several places perforated by small ulcerations, through which some feculent matter had escaped into the cavity of the peritonæum. The ileum being laid open, discovered a most extensive tract of disease, on its inner surface, the mucous membrane being extensively eroded, and in many



places completely destroyed, by round well-defined ulcers, some of which were as large as a shilling. The lower extremity of the ileum was the principal seat of these ulcers; but the disease extended over a great part of that portion of the small intestine; and, in several places, its coats were considerably thickened. The higher parts of the small intestine were healthy. The colon was collapsed, and externally healthy; internally there were in several places, especially on the left side, patches of inflammation on the mucous membrane; but they were slight and recent, and without any appearance of ulceration. The ileum contained a considerable quantity of fluid feculent matter, which was quite healthy in its appearance. In the higher part of the small intestine, there was a small quantity of dark-green viscid fluid, like inspissated bile. The colon contained only a small quantity of mucus, of a healthy appearance; other viscera sound.

As in this case there was considerable reason to believe that the original disease was contagious fever, the affection of the bowels may perhaps be considered as symptomatic. This occurred more distinctly in a case mentioned by Dr Duncan junior, in which the disease in the mucous membrane seemed to commence about the 23d day of the fever. The case was fatal in nine days more, and, on dissection, the disease was found nearly in the state of simple inflammation. At various parts of the mucous membrane, from the jejunum to the rectum, there were purple patches occurring, at first at intervals of an inch or two inches, and then running gradually more and more into each other, until, towards the termination of the ileum in the colon, the whole surface of the mucous membrane exhibited a deep purple hue. The mucous membrane of the caput coli had a similar appearance, but the arch was almost entirely free from it. It occurred again at the sigmoid flexure, and in the rectum, in addition to the venous congestion, numerous fungous looking patches presented themselves, from a quarter to half an inch broad, and elevated fully an eighth of an inch above the surface of the intestine. They had a very vascular appearance, but their surface was covered with a thin yellowish crust. This patient (a woman aged 60) seemed to be convalescent from fever with petechiæ, when about the 23d day of the disease she was attacked with diarrhœa without any complaint of pain,—the stools fetid and dark coloured,—the pulse varying from 80 to 100,—after six days she had considerable pain and bloody evacuations, and died exhausted on the 9th.

This symptomatic form of the disease is the affection which has lately excited much attention in France, under the name of *Fièvre Entéro-Mésentérique*, and has given rise to a very keen controversy in regard to the nature of it; one party contending that it is symptomatic of common fever,—the other



that it constitutes a peculiar species of fever, of which the affection of the mucous membrane is a primary and essential phenomenon. Numerous examples of it, in the state of simple inflammation, erosion, and ulceration, are described by Petit.\*

The following cases afford striking examples of inflammation of the mucous membrane in various stages of its progress, and in forms which may probably be considered as idiopathic:

CASE IV.—A girl, aged 5, had headach, anorexia, bad sleep, nausea, mucous vomiting, frequent pulse, dry skin, and pain of the abdomen, increased by pressure; bowels at first rather bound. Seemed much better after an emetic, and was thought convalescent for several days; but was then suddenly seized with violent looseness, which nothing could restrain; was rapidly exhausted, and died in ten days. The stools were liquid, greyish, and very fetid. *Dissection.*—The small intestines were discoloured, and on various parts of their surface, there were round red spots under the peritonæal coat, which corresponded with inflamed spots on the mucous membrane. The great intestine was of a “rose-violet colour,” which was deepest towards the rectum; the serous membrane seemed inflamed, and the parietes thickened. Two inches from the valve of the colon, there was in the inner surface of the ileum a large round ulcer with irregular edges, the bottom greyish and rugous, and easily torn off. Near it there were three other ulcers of the same character, but smaller. The mucous membrane between these ulcers was pale, and covered with numerous small black spots, which extended through the whole thickness of it. They were also seen on the valve of the colon, and on the appendix vermiformis. The mucous membrane of the lumbar colon of the right side was of a pale rose colour, and covered with small black spots, each of which had a grey circle round it; these circles were formed of a soft pulpy matter, which was easily raised, and discovered ulcers well defined, as if a piece had been cut out, the black points coming off along with the pulpy matter. In the transverse colon, there were other ulcers in the mucous membrane, covered by a thick grey matter, and increasing both in breadth and depth; their edges becoming more and more elevated, hard and fungous, and of a violet colour. In the descending colon, the ulcers ran so into one another as to present nearly one continued surface of ulceration. The mucous membrane was not observed at all, but a close succession of deep irregular ulcerated excavations, separated by fungous eminences, which were covered with black and red spots. In some places the ulceration had extended so deep as to destroy the muscular coat. The cavity of the rectum was full of a grey ichorous fetid matter.†

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\* *Traité de la Fièvre Entéro-Mésentérique.*

† *Cloquet, Nouveau Journal de Médecine, Tome I.*



This may be considered as an idiopathic example of this disease, fatal by that peculiar exhaustion which accompanies it, and which is much more rapid than simple exhaustion, depending merely upon the frequency of the evacuations. The following case affords an example of another termination of it, by the inflammation extending to the peritonæal coat.

CASE V.—A girl, aged 7, \* had symptoms similar to the preceding, and being treated upon the same plan, was considered as convalescent. After six days, she was seized with vomiting and copious diarrhœa, with constant acute pain in the abdomen, which was painful on pressure, but not enlarged. After eight days the pain suddenly increased, the belly became enlarged, with great sensibility, hiccup, vomiting, and all the signs of peritonæal inflammation, which in seven days was fatal. *Dissection.*—Peritonæal inflammation, with recent adhesions and serous effusion, in which there were flocculi of coagulable lymph. Near the end of the ileum, there was a round opening through which feculent matter had escaped. This opening had its origin in a large and deep ulcer on the inner surface of the intestine, much more extensive on the inside than the outside; its edges were elevated, hard and tubercular on the inner side, but thin on the outside. Near it were two other erosions of the mucous membrane, less extensive and less deep, and surrounded with black spots; other parts sound.

CASE VI.—A girl, aged 9, † had obstinate dysentery for two months, and was reduced to extreme emaciation. The pain then increased, the belly became tender to the slightest pressure, with all the symptoms of peritonæal inflammation, which was fatal in 23 hours. *Dissection.*—Extensive inflammation and adhesion of the intestines to each other, and to the abdominal parietes on the right side. There were also many livid spots, elevated, with thickening, and some ulceration of the coats of the intestine. About the middle of the ileum there were three ulcers of the mucous membrane, similar to those described in the preceding case.

This extension of the inflammation from the mucous membrane to the other coats of the intestine, seems to be a frequent termination of the disease. I have formerly described a remarkable case of it; in which unmanageable diarrhœa, of two or three weeks duration, was succeeded by symptoms of enteritis, which was fatal in two days. (Part II. Case XIII.) It occurred also in Dr Alison's case, Case III. of this paper. I have already expressed doubts whether some of the cases which I formerly considered as peritonæal inflammation, may not

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\* Cloquet, Nouveau Journal de Medecine, Tome I.

† Cloquet, *ut supra*.



have been really of this nature, particularly Cases II. and III. of Part II. In Case II. it is not improbable that inflammation of the mucous membrane had existed for some time, and that the disease was arrested by the treatment there described, when the inflammation was spreading to the peritonæum.

The colliquative diarrhœa of phthisical patients, and untractable affections of the bowels analogous to it, which supervene on various scrofulous diseases, seem to be often connected with inflammation and ulceration of the mucous membrane. In such cases I believe the ulcers are generally small, and sometimes the disease has not advanced beyond the state of chronic inflammation, with inflamed patches of a fungous appearance, a little elevated above the sound parts. In the following case the disease was in a more severe form.

CASE VII.—A boy, aged 11,\* had scrofulous disease of the left elbow-joint, for which he suffered amputation, and the stump healed favourably in sixteen days. About this time he was seized with pain of the breast and belly, and diarrhœa. The pulse was small and sharp; the tongue white; the belly was painful on pressure; the evacuations were copious, of a greyish colour, and fetid. He died in about three weeks.

*Dissection.*—There was effusion in the pericardium; the lungs were tubercular, and much diseased. The peritonæum was inflamed, and covered with lymph and miliary tubercles, like those of the lungs. The intestines were of a red-violet colour, with dark irregular spots. The inferior extremity of the ileum, the cæcum, and the sigmoid flexure of the colon, were pierced by small fistulous openings, which were surrounded externally by dark spots, and internally had their origin in large and deep ulcers of the mucous membrane, with elevated, reverted, and tubercular edges. They were most numerous in the large intestine, but did not extend to the rectum, the mucous membrane of which was only injected, and marked with red spots. In the inferior part of the cæcum there was a diseased mass, resembling the ulcerations, the size of a small egg. The mesenteric glands were enlarged, and contained soft tuberculous matter. The liver adhered to the stomach and the diaphragm, and on the omentum there were scirrhous granulations.

There are many other cases on record, which illustrate the phenomena of this important disease. A man, aged 60, whose case is described by Dr Duncan junior, was affected with diarrhœa, and pain about the umbilicus, which was not increased by pressure. The evacuations were frequent, yellow, and generally fluid, and were preceded by tormina; they were excited by taking food or drink. His pulse was natural, and his appetite good; but he was deterred from taking either food or drink,

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\* Cloquet, *ut supra*.



from the fear of inducing the diarrhœa. The disease resisted all the remedies that were used, and, without any particular change in the symptoms, was fatal in six weeks. On dissection, there were found marks of peritonæal inflammation; the descending colon and rectum were found much thickened; and, “at several places, the internal membrane of the intestines was partially, and at others entirely removed, marking the intestines as small-pox does the skin. In the cavity of the abdomen, about lb. vj. of a light yellow serum, with flakes of a similar colour.”\* A young man, mentioned by Morgagni, † was seized with tormina, with frequent bloody stools, which, after 15 days, was changed into a yellow diarrhœa, without tormina. This was soon followed by tertian fever, which terminated in a month. The diarrhœa still continuing, he was then seized with acute fever, which was fatal, with stupor, in 14 days. The termination of the ileum, and the commencement of the colon, were, for a considerable space, eroded, ulcerated, and in some places gangrenous on the inner surface. In many places, the intestine was perforated by the ulcers.

## § II.—*Examples of the Disease in Infants.*

CASE VIII.—An infant, aged 6 months, (13th May 1817,) had been affected for about a week with looseness of the bowels, and occasional vomiting. The complaint was considered as the common bowel complaint of dentition; but the stools were scanty, offensive, and dark-coloured, and though they were not very frequent, there was frequently observed a considerable tendency to sinking, with paleness and coldness of the body. After several days, the stools became natural, the vomiting ceased, the appetite returned, and the looseness was extremely moderate. These favourable appearances, however, were of short continuance. On the evening of the 18th, the looseness suddenly increased; it was excited by every thing that was taken into the stomach, and the articles taken seemed quickly to pass through. On the morning of the 19th, I found her pale and exhausted; and though the looseness was checked by opiate injections, every attempt to support her was in vain. She died in the afternoon, having lain through the day in a state of oppression resembling coma.

*Dissection.*—The bowels were externally healthy, except some spots of superficial redness. On the inner surface of the small intestines there were, in many places, irregular patches of inflammation; and, in other places, there were spots of limited extent covered with

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\* Clinical Reports, p. 133.

† De Causis et Sedibus, Ep. XXXI. § 2.



minute ulcers. These spots were whitish, or ash-coloured, of a honeycomb appearance, and were slightly elevated above the level of the surrounding parts; and on the external surface of the intestine, corresponding with several of them, there were the spots of circumscribed redness, or increased vascularity. The mesenteric glands were enlarged; other viscera healthy.

CASE IX.—An infant, aged 7 months, soon after weaning, was suddenly seized with vomiting and purging: was oppressed, fretful, and feverish: the stools were scanty and varied in appearance, being sometimes brownish, and sometimes pretty natural. After a day or two, the vomiting ceased; the looseness continued, not severe, nor very frequent, but accompanied by much oppression and feverishness, a brown fur on the tongue, and a remarkable dryness of the gums; the stools varying in appearance as before. Various remedies were now employed with little benefit. After four or five days, the child became comatose. This was relieved by blistering on the neck, and a purgative of calomel. The stools then became green, but generally scanty and watery. The febrile state continued, with the fur on the tongue. The child sunk gradually, with oppressed breathing, and died on the 9th day.

*Dissection.*—The bowels externally appeared healthy, except that on various parts of the small intestines there were spots of redness, which had not the appearance of superficial inflammation, but of red surfaces situated beneath the peritonæal coat, that coat itself being healthy. At the parts corresponding with these spots, the inner membrane was elevated into irregular patches of inflammation, and the inflamed surfaces were covered by very minute ulcers. In the neighbourhood of these inflamed portions, the mesentery was unusually vascular. The colon was collapsed, and externally healthy; its inner surface presented an unusual appearance, being in many places covered by very minute vesicles, scarcely elevated above the surface of its inner membrane, but shining through it, clear, transparent, and watery; they were most numerous in the caput coli, but were observed through the whole course of the colon; and they were the only morbid appearance in the colon, there being no vestige either of inflammation or ulceration.

These two cases will serve to exemplify the disease as it occurs in infants. The following case, for which I am indebted to Dr Oudney, exhibits the disease at a more advanced age.

CASE X.—A girl, aged 3 years, was attacked about three weeks before her death with vomiting, frequent calls to stool, and uneasiness in the abdomen; the evacuations were reported to have been frequent, slimy, and fetid. After eight or ten days, when Dr Oudney first saw her, she had frequent irregular febrile paroxysms; the abdomen seemed to be painful on pressure; she had frequent stools of a clay colour, and she vomited often; her tongue was white; there was urgent thirst, especially during the febrile paroxysms. In this



state she continued until a few days before death, when she became oppressed, and partially comatose; screamed frequently, and expressed great unwillingness to be moved. The febrile exacerbations still continued, the pulse varying from 130 to 150, and she had frequent stools, which were now of a dirty green colour, mixed with specks of yellow. The pupil was natural, and continued sensible to light until a few hours before death, which happened on 8th February 1820. *Dissection.*—The ileum, from its termination in the colon to near the jejunum, was highly vascular, its minute vessels appearing as if injected. Its mucous membrane was covered with numerous irregular inflamed patches, which had a fungous appearance, considerably elevated above the level of the sound parts, and covered with small ulcerations. Some of these patches were the size of a shilling, others smaller, they were generally at the distance of an inch or two from each other, and the membrane in the intervals was healthy. The mesenteric glands were greatly enlarged, and very vascular.

### § III.—*Examples of the Chronic Form of the Disease.*

CASE XI.—A lady, aged 35, died in April 1818, after having suffered for nearly four years from a diarrhœa which had resisted every remedy. I saw her a few weeks before death, and found her pale; withered, and emaciated, with frequent pulse, slight cough, and considerable uneasiness in the abdomen. The diarrhœa occurred several times every day, and the stools were thin and feculent, and not unnatural in their appearance. At the commencement of the complaint she had suffered much from pain in the bowels, and occasionally through the whole course of it, but it was not constant, nor confined to any particular part. A variety of remedies had been employed at different times, and frequently the disease had been restrained by them for some time, but it always returned after a short interval with the same violence as before. She had no vomiting, the cough had begun within the last year of her life, and was never severe. For some time before her death she had aphthæ of the throat. *Dissection.*—The bowels were externally healthy, except in several places of the small intestine, large spots of a dark red colour, which seemed to be deep-seated, as if shining through the peritonæal coat. At the places corresponding with these spots, the mucous membrane was elevated into patches of a fungous appearance and dark red colour, and on these portions there were numerous small oval ulcers, the bottoms of which were smooth and pale, while the parts around were of a dark red. At these ulcers, the intestine, when held up to the light, was semitransparent, they were found wherever the dark fungous appearance existed, and this was on a considerable part of the small intestines in irregular portions, some of which were six or eight inches in length. The colon was externally healthy; internally, there were many small ulcers, which had a different character from those on the



small intestines. They were more distinctly ulcerated at the bottom, few of them larger than the diameter of a split pea, but each surrounded by a firm elevated margin, and there was no discoloration of the surrounding parts. They were chiefly observed in the ascending colon and the arch. On the inner surface of the stomach, near the pylorus, and of the œsophagus through its whole extent, there were observed numerous very small erosions, of an oval shape, and scarcely larger than the diameter of a pin-head. The lungs were tubercular, and in the left lobe there were several small abscesses. The other viscera were sound.

In this case I think it probable that the original disease was in the colon, where the ulcers appeared to be of long standing. Those in the small intestine were probably more recent. The following case shows the disease in a more violent form:

CASE XII.—A girl, aged 13. Her complaint began about a year before her death, with pain of the abdomen and frequent vomiting. The bowels were at first natural, but soon became loose; and from that time she was almost constantly affected either with diarrhœa or vomiting, and sometimes with both at once. She became gradually emaciated, but was not confined to bed until a month before her death, which happened in June 1814. When I saw her about a week before she died, she was emaciated to the last degree, with some cough, and a small frequent pulse. She had still frequent diarrhœa and vomiting, and complained of constant pain in the bowels, which was increased by pressure, but the abdomen was soft and collapsed. *Dissection.*—The caput coli was dark-coloured, hard, and much thickened in its coats; internally, it was much eroded by ulceration, and the disease extended in the form of numerous smaller ulcers, about three inches along the ascending colon. The valve of the colon was destroyed by ulceration. The lower end of the ileum, to the extent of about eighteen inches, was distended, thickened in its coats, externally of a reddish colour, and internally covered by numerous small ulcers, varying in size from the diameter of a split pea to that of a sixpence. They were clean and well defined, as if a piece had been cut out. The lungs and all the other viscera were healthy.

CASE XIII.—A boy, aged 12,\* about eighteen months before his death, suffered for some time from severe and obstinate diarrhœa, and from that time he was much troubled with pain in his bowels, and was liable to occasional diarrhœa, and to vomiting. The vomiting occurred especially after a full meal, and he suffered occasionally from pain in the lumbar region, which was aggravated by the erect posture. On the 22d May 1819, he had severe pain in the lower part of the back, but did not complain of his belly, and there was

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\* London Medical Repository for December 1819.



neither fulness nor tenderness of the abdomen. Pulse 120. Bowels had been moved four times the day before, and once in the night. (23d.) Pulse 100; pain abated; no stool; sunk rather unexpectedly, and died in the night. *Dissection.*—A part of the ileum was found much contracted, and its coats much thickened. Above and below this part, there were small ulcers of a honey-comb appearance, with hard and thickened edges; the surface of them was of a dark cineritious appearance, and the coats of the intestines felt hard and knotty. The inner surface of the strictured part was also ulcerated. Below this part, there was a portion of a dark livid colour, and below that, another contracted and indurated part, which occupied the last three inches of the ileum. In this part there had been numerous ulcers, some of which had healed and left hard cicatrices, and the whole inner surface of this portion was puckered, ragged, and irregular, and the area of the intestine very much contracted.

It is by the thickening of the intestine which occurred in these cases, at last destroying the muscular action, that the disease is sometimes succeeded by obstinate costiveness or ileus. A gentleman, whose case was communicated to Dr Monro by Dr Sanders, had been liable for twenty years to heartburn and occasional vomiting, and generally had five or six liquid stools every day, which were sometimes slimy and streaked with blood. He was afterwards affected with such obstinate costiveness that he had no stool for nine days. After this the diarrhoea returned, with vomiting, and he died at last with great distention of the abdomen and costiveness. The intestines were found extensively adhering to each other; and an extensive portion of the ileum was distended, very much thickened in its coats, and internally covered with various tumors, indurations, and ulcers. \*

The following case shows the state of the disease, when the patient died of another affection, while the symptoms were going on.

CASE XIV.—A man, aged 72, was affected with diarrhoea, and acute lancinating pain in the abdomen; he had voracious appetite and good digestion. Various remedies were employed without benefit for four months and a half, at which time he was seized with an affection of the brain, and died comatose in six days. *Dissection.*—Extensive serous effusion in the brain, and a suppurating tumour in the right hemisphere. On the small intestine there were some adhesions, and many dark spots. The middle part of it adhered to the left side of the colon at its lower part, and at this place a free communication had taken place between them by a ragged irregular open-

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\* Monro's Morbid Anatomy of the Gullet, p. 306.



ing, with loose ragged edges. There were numerous ulcers in various parts of the mucous membrane of the small intestine, which corresponded with the dark spots on the outer surface. These ulcers were round, with elevated edges; the bottom of them was grey, unequal, and covered with mucus. \*

The symptoms may be equally severe, though the disease be less extensive. A woman, above 30 years of age, had been for some time affected with pectoral complaints, and a fixed pain in the umbilical region. She had then, after repeated injuries from falls, a pain in the left lumbar region, which prevented her from sitting, though she was able to walk. This continued three months, and was succeeded by amenorrhœa, with hemorrhage from the anus. This ceased after three months, the menses returned, and she was affected with diarrhœa. The diarrhœa ceased, and was succeeded by a grey discharge from the vagina, which continued for several months, and was succeeded by intermittent fever. This succession of disorders terminated in diarrhœa, which continued a year, and was then fatal. The evacuations were accompanied by severe pain, and consisted of various matters, mucous, ropy, and shreds of membranous concretions, and for two days before death much blood was discharged. *On dissection* the lungs were found adhering extensively to the pleura costalis; the liver was grey, red, and white, the latter colour predominating. The heart was a third smaller than usual. The commencement of the ileum was black, and the mucous membrane of this portion showed a cancerous ulceration. †

These cases will be sufficient to illustrate the disease in its most common forms, terminating by ulceration of various extent, and, in some cases, accompanied by thickening of the coats of the intestine. In the following case, in which the disease was of considerable standing, it had not advanced to ulceration.

CASE XV.—A gentleman, aged about 50, had been for several years liable to looseness of his bowels. It attacked him most frequently in the night time, and often obliged him to get up several times in a night. His general health, however, was not much affected till a few months before his death, when the diarrhœa became more severe, and resisted every remedy. His strength sunk; he became pale and emaciated: with bad appetite and bad digestion; and died gradually exhausted. *Dissection.*—The liver was enlarged, pale, and tubercular. The intestines were externally healthy. Internally, the mucous membrane was in many places elevated into portions of a

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\* Cloquet, *Nouv. Jour. de Medecine*, Tome I. p. 29.

† Pinel. *Médecine Clinique*, p. 254.



dark red colour, and fungous appearance. These portions were observed through the whole tract of the intestine, generally in broad rings, going quite round the intestine, with intermediate portions of a healthy appearance. They were most numerous in the small intestine. No ulceration was observed in any part.

I shall only add one other case, showing the state of the parts when the symptoms had ceased after long continuance, and the patient died of another disease.

CASE XVI.—A lady, aged 24, had been of a feeble and delicate habit from her early years ; but, from the age of 15 or 16, had been almost constantly in a valetudinary state ; was generally confined the whole winter with cough, pain of her bowels, and diarrhœa ; got a little better during the summer, but was constantly, more or less, affected with diarrhœa and occasional pain in the bowels ; variable appetite, bad digestion, and general debility. In this manner she had passed six or seven years, when she came to Scotland in summer 1815. She was then much emaciated, with a constant loose state of her bowels ; the evacuations were fluid and whitish, and usually occurred four or five times every day. When at any time they were less frequent, she became oppressed about the stomach, and extremely uneasy. She had frequently pain in the bowels ; her appetite was bad ; the pulse natural. In the winter the same state of her bowels continued, and she had a loud noisy cough, without expectoration. In summer 1816 she began to improve considerably, having appeared to derive benefit from large doses of the tinct. muriat. ferri, combined with tincture of hyosciamus. The bowels got into a more natural state ; the stools became consistent and healthy, and from this time there was no return of the former state of her bowels ; but her appetite was bad, with very bad digestion, and she made little improvement either in flesh or strength. In the following winter her cough returned, at first without expectoration ; but afterwards she had pain of her breast ; frequent pulse, and purulent expectoration, and died of phthisis in May 1817, without any complaint in her bowels. *Dissection.*—The lungs were extensively tubercular, with numerous small abscesses. The lower half of the stomach was contracted, and considerably thickened. The pylorus also was a little thickened, but not hardened. On the internal surface of the intestines, there were many portions, several inches in extent, of a dark red colour, and more vascular than the other parts ; and, on many places, there was the appearance of small, smooth cicatrices. The other viscera were healthy.

Besides the various forms of the disease which are exemplified in the above cases, there are some others which are deserving of notice. One appearance has been observed which does not occur in any of the cases which I have mentioned, I mean small tubercles or pustules resembling small-pox, covering the mucous membrane. This appearance has been observed by Petit, and



Lieutaud refers to several examples of it. I have also to add, that the disease sometimes terminates by peritonæal inflammation in a chronic form. In these cases we find the usual symptoms, untractable diarrhœa, going on for a long time, or alternate diarrhœa and vomiting, and besides the usual appearances in the mucous membrane, we find the intestines extensively glued together by very firm adhesions of long standing. A case of this kind, in a child three years of age, is mentioned by Mr Howship. The first symptoms were diarrhœa, impaired appetite, pain of the belly, irregular feverishness, and emaciation. After two months the diarrhœa subsided, the stools being not more frequent than natural, but the emaciation increased, with pain and tumefaction of the abdomen, and constant fever. The child was thus cut off by rapid exhaustion; the bowels, for a short time before death, being rather bound. On dissection all the intestines were found glued together into one mass by most extensive deposition of coagulable lymph; the villous coat of the small intestine was in several places destroyed by ulceration, and at one place there was a perforation a quarter of an inch in diameter.

The symptoms and morbid appearance which have been mentioned seem to form the leading phenomena of this important class of diseases, as far as they have been hitherto ascertained. But much observation is required to make us fully acquainted with the subject. It is probable that the disease exists in a much more limited degree than in the cases which have been described, and accompanied by symptoms which are much less defined. It is probable, also, that there are important varieties of the symptoms, depending on the seat of the disease, particularly in regard to the degree in which the stomach is affected. There seems to be one form of it in which vomiting is the prominent symptom, especially in the early stages. There is much reason to expect, that an accurate investigation of the subject will throw much light upon many affections which are at present involved in much obscurity, and which are often indiscriminately classed together under the very indefinite term, *disorders of the chylopoietic viscera*. A gentleman, aged 34, who had formerly suffered from dysentery, but had been free from any symptom of it for several years, was observed to look ill, and to lose flesh, without any defined complaint, except nausea and indigestion; his spirits were depressed; and his bowels were irregular, being sometimes loose, and sometimes the reverse. After several months had passed in this manner, he had frequently vomiting, and a distressing sensation of heat in the stomach and œsophagus. He sometimes took food with eager-



ness, and sometimes refused it. His pulse continued natural until three days before his death; he then had convulsive affections and delirium, with frequent pulse, and died in a state of coma, which continued about 12 hours. His death happened about a fortnight after the commencement of the vomiting. On dissection, all the viscera were found perfectly healthy, except about 18 inches of the lower extremity of the ileum. The coats of this portion were livid, and several indurations might be felt through it. Its internal surface was covered with ulcers of various sizes, from the size of a bean to that of a half-crown piece; these were circumscribed, but very rugged, from a great quantity of fungous substance thrown out both from their surfaces and edges.\* A woman, aged 55, was affected with weakness, emaciation, and loss of appetite, without any fixed complaint, except occasional colic pains, which were transient and very slight, and discharge of blood by stool, which was considered as hæmorrhoidal. After she had been affected in this manner for six months, she became suddenly comatose, and died on the following day. On dissection, no disease could be detected in the brain. Nearly the whole extent of the rectum was occupied by a cancerous ulceration. The remainder of it, and the left side of the colon, were red, and purple, as if sphacelated. The other viscera were sound.

#### SECT. V.—*Pathological Conjectures.*

The effects of inflammation on the mucous membrane of the intestine appear to be, morbid sensibility, with increased secretion of mucus, and morbid irritability of the muscular fibres which are connected with the inflamed part. The part thus affected seems to be excited to increased contraction by the ordinary mild contents of the canal, in the same manner as, in its healthy state, it would be excited by acrid contents, or by its appropriate stimulus, purgative medicine. Now the symptoms produced by such a morbid condition will vary considerably, according to the seat and the extent of the disease; for, if we suppose the healthy contraction and dilatation of the canal to be going on in the usual manner, propelling downwards the usual contents, it is probable that the increased action will only commence when these arrive at the part which is inflamed; hence the affection differs remarkably from a general increase of the peristaltic motion; because the parts above do not participate in

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\* Memoirs of the Medical Society of London, Vol. VI. p. 128.

† Pinel. *Medecine Clinique*, p. 257.



it. For the same reason, there is probably a diversity in the symptoms, according to the kind of contents which are present. If these are fluid, they seem to be received into the inflamed parts, and instantly transmitted by a violent contraction; but, if they are solid, and of any considerable dimensions, and consequently requiring for their transmission a greater dilatation than is required for fluids, the effect probably is, such a sudden and violent contraction, on the first contact, as rather resists their transmission into the inflamed part, and causes them to be retained in the part immediately above. Hence probably arise remarkable diversities in the symptoms, according as the disease may be confined to the region usually occupied by consistent feces, or may extend into the region of fluid feces, or into the higher regions, where the process of digestion is not completed. In the first case, the discharge probably consists chiefly of the secretion from the diseased parts, while the natural feces are retained; in the second, of healthy fluid feces; in the third, of articles of food or drink, partially changed, mixed with the biliary and other secretions, and varying considerably, as one or other of these articles may predominate in quantity at different times. If this view of the subject be correct, it will present to us such extensive sources of variety in the appearance of the matters evacuated, as must shake our confidence in them as a ground of diagnosis; and it is the high importance of this point, in a practical view, that has led me into these observations. That such diversities do occur, even in the most formidable states of the disease, appears from the cases which have been described: In some of them, though they were advancing rapidly to a fatal termination, the evacuations did not differ from the matters discharged in a simple diarrhoea; and, in case 3d, the ileum, which was the principal seat of the disease, contained fluid feces in considerable quantity, and of a perfectly healthy appearance, in immediate contact with the diseased parts. Besides the sources of variety now referred to, there are others which may result from the period of the disease in particular cases; for, by repeated copious evacuations, the canal may be cleared of feculent matter, especially in a case in which appetite and digestion are much impaired. In such a case, the evacuations might be first copious and feculent, afterwards scanty, and consisting chiefly of the secretions from the parts, or watery matters, taken as drink, might pass through, tinged by these secretions. The important practical principle which I wish to found upon these observations is, that this highly dangerous and insidious disease may go on with every variety in the appearance of the evacuations; and that it may be advancing ra-



In referring to the terminations of this disease, I have mentioned a singular fact in regard to it, in infants, a tendency to terminate by effusion in the brain. To call this a translation of the disease, is merely expressing the fact in other words, and leads to no principle whatever ; but it is a curious subject of investigation, whether this be an accidental combination, or whether there be any principle to which it can be referred. I have, in a former paper, alluded to a remarkable connection betwixt effusion in the brain, and suspension or great diminution of the secretion of urine, such as occurs in the ischuria renalis. Now, all inflammatory affections of the abdomen are apt to derange the secretion of urine, especially in children, and it is a matter of fact, that a remarkable diminution of it often occurs in this disease, and has been frequently observed to precede the appearance of coma. What is the connection here we know not, and probably never shall know, but that ischuria renalis is followed by effusion in the brain, I consider as a pathological principle, or rather a pathological fact, which is perfectly established. It presents an interesting subject of investigation, whether this principle has any reference to the connection which has often been observed in children, between affections of the bowels and effusion in the brain.

#### SECT. VI.—*Outline of the Treatment.*

The active form of the disease, especially in its early stages, is to be considered as an inflammatory affection of the most dangerous kind, and requiring to be treated with activity by the usual remedies—especially bloodletting. The first urgency of the inflammation being thus subdued, if the pulse continue frequent, digitalis is given with much advantage, or Dover's powder, in repeated doses ; and, after the necessary bleeding, moderate opiates may be given, with mucilaginous articles and absorbents, or opiate glysters. The effect of purgatives is extremely ambiguous. In the more severe cases, they evidently aggravate the symptoms. There may be cases in which it is expedient to evacuate the bowels, as when the discharges are scanty and slimy, with retention of natural feces, but the practice requires caution ; and in the more common form of the disease, with copious discharges, they appear to be injurious. Though the evacuations in such cases may be of an unnatural appearance, it is to be remembered, that this is the result of morbid secretions, not to be corrected by purgatives, but by curing the disease on which they depend. When the disease appears to be



seated in the lower part of the great intestine, bleeding from the hæmorrhoidal vessels might probably be useful. When the tormina are severe, with tension of the abdomen, the tobacco injection might probably be employed with benefit. Great attention should be paid to the ingesta; to keep them in as small quantity as possible, and of the mildest quality.

It is in infants that the disease most frequently occurs to us; and there is some difficulty in determining what is the best treatment. This results from the difficulty of distinguishing the disease, so that, when a case terminates favourably, we cannot say, with certainty, that it really was an example of this dangerous affection. In some cases, in which there is no vomiting, a gentle emetic seems to be useful in the early stages; afterwards, Dover's powder, combined with chalk, opiate glysters, opiate frictions, opiate plaster, and tepid bath. In some cases, the free use of digitalis seems to be extremely useful, and blistering on the abdomen. It is worthy of consideration, whether topical bleeding would be admissible in the early stages, when the disease exhibits much activity. In the advanced stages, when there is a tendency to sinking, wine is to be given very freely; when there are threatenings of coma, blistering on the neck should be employed; from both these conditions, infants often make most unexpected recoveries. When the case is accompanied, as it often is, by a peculiar and most ungovernable vomiting, blistering on the epigastrium seems to be the most effectual remedy; and considerable benefit, on settling the stomach, is often obtained from the vegetable bitters, as the powder of colombo root, in doses of a few grains, repeated at short intervals. In the protracted bowel complaints of infants, in which there was reason to apprehend this affection in a chronic form, I have found nothing so useful as lime-water. The teeth are to be attended to, and the gums cut, when they appear to be giving irritation.

In the chronic form of the disease, what we have to contend with is either the chronic fungous inflammation, or ulcération. The treatment is extremely precarious, and very few of the cases end favourably. The remedies to be kept in view, and which appear in some cases to be useful, are chiefly the following: Lime-water, the vegetable bitters, and astringents, especially the cortex cuspariæ and logwood; preparations of iron, as the tincture of the muriat in large doses; small quantities of mercury, with opium; the resins, as turpentine and bals. copaivæ, combined with opium; sulphur with opium; repeated blistering on the abdomen; bandaging with a broad flannel roller; the tepid salt water bath.

A lady, aged 30, came under my care in spring 1813, affected in the following manner: She had a remarkable tenderness of the inside of the lips, the tongue, and the throat; a constant discharge of saliva; a burning uneasiness in the tongue, throat, breast, and stomach; and great uneasiness in swallowing, and for some time after it. She had a constant tendency to diarrhœa, and a feeling, as if food or drink did not remain in the stomach, but passed immediately into the bowels: there was some cough, frequent pulse, great debility, and increasing emaciation. The throat appeared raw, and a little inflamed. The edges of the tongue, and the inside of the under lip, were excoriated, and covered with small ulcers, with inflamed margins. There was a painful excoriation about the anus and the labia. The complaint was of about three months standing, and had begun while she was in the puerperal state in England. A great variety of practice was employed without the smallest benefit. She became wasted and debilitated to the greatest degree. The diarrhœa became incessant, with violent pain, and a feeling as if every thing she swallowed passed through her immediately. She had no relief, but from large opiates; and that relief was but slight and temporary. When the case appeared to be hopeless, she began to take a decoction of logwood, (℥i to lb. i, a wine-glassful four times a-day,) with opiates, wine and nourishment. From this time she recovered daily, and in two or three weeks was in perfect health.